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The Sight-Saving Review

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Table of Contents

PAGE

THE EYE PROBLEM IN THE NATIONAL DEFENSE SITUATION, Harry S. Gradle, M.D. 3

EYE PROTECTION IN THE DEFENSE INDUSTRIES, Joseph A. Haller 11

LEGIBILITY IN COMIC BOOKS, Matthew Luckiesh and Frank K. Moss 19

THE SPECIALIZATION OF CONSERVATION OF VISION IN INSTITUTIONAL NURSING, Cora L. Shaw, R.N. 25

REPORT ON THE GLAUCOMA CAMPAIGN, Mark J. Schoenberg, M.D. 32

GLAUCOMA PROGRAM AT THE MASSACHUSETTS EYE AND EAR INFIRMARY, Garrett L. Sullivan, M.D. 36

THE RESTORATION OF SIGHT AND PREVENTION OF BLINDNESS IN KANSAS, Harry E. Hayes 44

SIGHT RESTORATION AND PATIENTS' REACTIONS, Edith E. Gutzeit 62

NOTE AND COMMENT:

Summer Courses for Training in Sight-Saving Class Work 71

Society's Program for the National Conference of Social Work 71

Fourth of July Fireworks Injuries 72

Vision in our National War Effort 73

PAGE

Vitamin A and Color Blindness 74
Eyes Supplied by Dead for Living Blind 74
Control of Epidemic Virus Conjunctivitis 74

BOOK REVIEW, by Sally Lucas Jean 76
Briefer Comments 78

CONTRIBUTORS TO THIS ISSUE 80

The Eye Problem in the National Defense Situation*

Harry S. Gradle, M.D.

DISCUSSES the eyes in the selective service examination; the eyes of the armed forces; and the rôle of the ophthalmologist in the present emergency.

A NATIONAL emergency, such as we are now entering upon, presents untold problems, both immediate and future. Some are beyond the range of solution, but the majority can be solved by co-operation, work, and patience. The ophthalmological problems that are raised by the demands of these times are interesting, somewhat embarrassing, but not beyond the possibilities of our present knowledge and capacity.

These can well be divided into three main aspects:

(1) The rôle of the eyes in the application of the Selective Service Act; (2) the rôle of the eyes in the armed forces of the United States; and (3) the rôle of the ophthalmologist in the present emergency.

The Eyes in the Selective Service Examination

Enormous consternation was created when the first analysis of the results of the physical examination of selectees began to appear. These dealt with men from 21 to 35 years of age, and the public confidently expected the announcement that here was the cream of the youth of the country, bursting with health and physically fit for anything! But when the examining boards turned over their reports to the statisticians, who came out bluntly with the fact that 43 per cent of the men examined were unfit for full military duty,

* Presented at the Biennial Conference of the National Society for the Prevention of Blindness, December 5, 1941.

a gasp went up all over the country. Although that gasp was heartfelt and deep, still, as is the custom all over the world, the public soon turned from that shocking fact to the routine business of making a living and enjoying life—all, that is, except a few who were aware, either officially or privately, of the dread implication that these figures involved. But before we consider the activities of these few, it would be well to analyze the eye aspect of those figures.

Approximately 43 per cent of the first million men examined were rejected for full military service because of physical defects: 20 per cent were put into Class IV-F, and 12 per cent into Class I-B, by the local examining boards; and an additional 11 per cent were rejected by the Army Induction Boards. Roughly, 5 per cent of the total number, or 50,000, were found deficient as far as eyes were concerned. Four-fifths of that number were rejected because of errors of refraction and one-fifth because of disqualifying eye disease. That percentage of ocular deficiencies is only slightly greater than it was during the first World War, when the figure, based upon the examination of more than four million men, was 4 per cent—and this despite the more rigid standards of today. In 1917, it was merely necessary that one eye could be corrected to 20/40, whereas now the vision in either eye must be better than 20/100, correctible in each eye to 20/40. Statistics for comparison of 1917 and 1941 on the basis of the same standards are not available.

Approximately one-fourth (26.13 per cent) of the men rejected were found to have ocular defects. That figure may again be divided into those whose eye defects were of sufficient gravity to preclude any military service whatsoever—8.99 per cent (Class IV-F) and those who could qualify for limited service—17.14 per cent (Class I-B). To reduce that to concrete figures—of the first million men reporting to the local Draft Board, 430,000 were rejected for full military service because of physical defects, 50,000 of which were ocular. Of these, approximately 17,000 had serious eye conditions that rendered them unfit for any military duty, while about 34,000 had ocular difficulties that would permit of only limited military service.

It must be remembered that these figures deal with the entire

age group of 21 to 35 years. Much lower rejection statistics appear for the 21 to 28 year old group, but these are not yet available in sufficient quantities to justify comparisons.

Reverting for a moment to the concern aroused by the first published analyses, immediate action was inaugurated by the President, who appointed a Commission on Rehabilitation, under the chairmanship of Dr. George Baehr of New York. It was the duty of this Commission to investigate the causes for rejection on purely physical grounds and to propose a plan for the physical rehabilitation of the rejectees in so far as possible. It was estimated that approximately 50 per cent of the rejectees could be so rehabilitated as to be acceptable for full military service. A plan was submitted through the Federal Security Agency and the duties of rehabilitation have been but recently put into the hands of the Selective Service Agency by the President.

Where does the National Society for the Prevention of Blindness fit into the picture so far? It doesn't yet; but it can, by preventing a repetition of such figures in the future. Our examination of 1,340,000 children in the schools of Illinois revealed deficient vision of a greater or lesser extent in 17.5 per cent, of which 1.82 per cent fit into the class of vision of less than 20/70—which is roughly comparable to draft requirements. After an intensive program of correction had been under way, re-examination five years later showed that the percentage of defects had fallen to 10.8 per cent. In other words, correction of defective vision in young children by all means possible results in a very appreciable decrease in visual deficiency in later life. Of 146,323 high school children examined over a two-year period, 13.1 per cent showed visual defects. Approximately 10 per cent, that is, 1.34 per cent of the total, fell into the group with vision less than 20/70. This leads to the conclusion that intensive work by the National Society for the Prevention of Blindness in fostering the visual examination of school children and instituting a subsequent corrective program will lead to a marked decrease in rejection for visual defects of these self-same children when they arrive at the age for selective service.

This is only the military point of view, which unfortunately will probably pertain for some decades to come. But the broader aspect deals with the problem of preventing the visual defects that in-

crease with age to the point that the individual enters the great army of unemployables that has to be supported by the state. The cost of rehabilitation, great as it may seem, will be returned manyfold in decades to come by the prevention of the physical defects that eventually cause the individual to become a public charge. And not the least among these are the visual deficiencies under discussion.

The Eyes of the Armed Forces

Certain essential visual requirements are demanded for admission to the Armed Services, and these vary somewhat in peace time from the present military emergency. In the past, the ophthalmic requirements for entrance into the military and naval academies have been very strict, but under the urgent need for trained officers and the consequent shortening of the term of study, the ocular specifications have been somewhat relaxed. Most interesting is the recently proven fact that the intensive study in the Academies has developed a low myopia in a fair proportion of the students. A refractive error necessitating the use of glasses is no serious handicap to an army officer, even on active field duty; but a deck officer in the navy cannot use correcting glasses on active sea duty because of spray, etc. The same visual requirements, slightly relaxed, apply to reserve officers of the forces. However in the medical department, greater latitude is permitted for obvious reasons.

The enlisted personnel of the army and navy do not have the need for the intensive visual tasks required of the commissioned personnel, and consequently the visual requirements for admission to the ranks are on a lower standard. There is a rigid adherence to these standards to date, but as the reserve pool of manpower eligible for active duty decreases, it is sure that limited service will be introduced which will release able-bodied men from non-combatant positions. There is no reason why a man with only one eye cannot hold down a desk job in the army just as efficiently as he does in civil life. But before that time comes, there will have to be a change in army and navy regulations, as well as in sentiment.

The visual requirements for the commissioned personnel of the air forces are justly the most rigid of all services. Up to a few

years ago emphasis was laid upon the ears and the vestibular apparatus of a pilot, but now it is recognized that those are of minor importance and that the eyes play the major rôle. In these days of high speed, great altitude, and fast reversals of bodily position, it is of vital import that the ocular functions of the flyer be at maximum efficiency. Deviations from the normal in refraction, in muscle balance, in fusion, and in depth perception may mean the difference between life and death to the pilot and the loss of a precious plane. No matter whether the flyer falls into the fighting, the bombing, the observation, or the teaching group, his whole visual apparatus must be of the best and must be maintained. This is not the place to list the "dry-as-dust" visual requirements of all of the armed services, but they may be found in the newly published *Manual of Ophthalmology*, produced under the direction of the National Research Council, or in the last edition of May's valuable *Manual of Diseases of the Eye*.

Early in the emergency the authorities very wisely started to organize the medical forces of the country to cope with eventual situations. The work was placed in the hands of two main committees: a co-ordinating group formed by the Surgeons General of the Army, Navy, and the U. S. Public Health Service, the Chairman of the National Research Council, and Dr. I. Abell, representing the American Medical Association. The other committee was the National Research Council, who established subcommittees to deal with individualized and specialized problems. The function and work of the two committees are quite divergent, but close liaison is maintained and greater efficiency is obtained.

The Rôle of the Ophthalmologist in the Present Emergency

In an emergency such as the present, there are four main rôles for the ophthalmological profession: (1) duty with the armed forces; (2) care of the civilian population; (3) teaching of undergraduate and graduate students; and (4) examination of selective service men.

The first duty of the sub-committee on ophthalmology of the National Research Council was to determine whether or not there was a sufficient number of trained men to fulfill these requirements and, if not, to provide adequate training courses to meet the

deficiency. Accurate statistics were lacking, but in round numbers it was found that about 6,000 physicians had special knowledge of the subject. Approximately 2,000 are men in general practice who do refractions also. Another 2,000 have had more or less adequate training and usually do ear, nose and throat work, combined with eye work. The remaining 2,000 have been certified by the American Board of Ophthalmology.

The armed forces require 7,500 physicians per 1,000,000 men. Approximately 250 of the medical personnel should be ophthalmologists, which indicates a necessity today of 500 ophthalmologists on active duty. In the advent of active hostilities, with resultant casualties, the number would have to be increased somewhat. It is extremely unlikely that the armed forces will exceed 4,000,000, which would mean the requirement of 1,200 to 1,300 ophthalmologists. So the number to fulfill the necessities of (2), (3), and (4) enumerated above would be only 20 per cent less than the existing number of civilian physicians practicing ophthalmology. Consequently, it was not deemed necessary to institute special courses for rapid training and thus lower the professional standards of the specialty.

The duties of the ophthalmologists with the armed forces are varied, but do not deviate materially from civilian practice. Geriatrics plays no rôle, and the surgical procedures are mainly those depending upon trauma and not disease. Visual examinations and refractions occupy most of the attention until battle casualties appear. In such cases, first aid has already been rendered and reparative measures are in order. However, the number of ocular injuries is comparatively small in the total roll of casualties.

The work required in caring for civilian population, teaching undergraduate and graduate students, and examining of selective service men will have to be performed by the 80 per cent of ophthalmologists not called to duty with the armed forces. Inasmuch as the services utilize only men from 21 to possibly 30 years, the total amount of civilian work as compared to peace time will not decrease materially, for the men of that age comprise only a very small percentage of routine practice. But to the usual civilian work must be added that entailed by possible non-military bombing, should we be so unfortunate as to undergo the terrific aerial

punishment that has been inflicted upon England. Our civilian physicians must be prepared to undertake at least the first-aid treatment of severe ocular injuries. To that end, there has been prepared, under the direction of the National Research Council, the *Manual on Ophthalmology* for the general physician who has not ophthalmic advice readily available. Specific instructions, particularly for the management of wounds and gas injuries, utilizing only facilities available to all medical men, are set forth in abbreviated form. It is hoped to place this book in the hands of all medical officers on duty with troops as well as in the hands of civilians in general practice. All this does not mean that the civilian eye physicians of the United States are going to have to do 20 per cent more work, for, as the country enters active hostilities and the war costs mount, much of the present non-essential ophthalmologic work will be postponed or entirely eliminated.

It is believed that the same wise policy as in the first World War will be adopted, of not permitting the teachers to enter active duty. This country will continue regardless of the outcome of the war, and physicians and ophthalmologists will still be required. So the schools for undergraduate as well as graduate teaching must be maintained and the men trained as teachers must continue. Russia made the sad mistake of trying to make doctors by a short cut, but realized the error in time before the medical resources of the country were depleted. Germany, by necessity, is falling into the same course, but because of the drain of her manpower cannot do otherwise. *Germania delenda est*, and to accomplish that, our professional personnel and facilities must be expended wisely and not to the point of depletion.

Ophthalmological examination of the selective service men is in the nature of a consultation, and hence requires a comparatively small amount of ophthalmological time. This is and will be done by civilian oculists as an adjunct to their clinic and private practice and represents their voluntary contribution toward the preparation of the armed forces for the defense of the nation.

This rather abbreviated summary of the rôle of ophthalmology in the present national emergency must, of necessity, skip many points that are of personal rather than collective interest. Undoubtedly changes in policy will take place as situations unfold and

the activities of today will be history by tomorrow. But come what may, I believe that the ophthalmological profession is capable of coping with the problems that are and that will be, and we shall continue to be in the vanguard in rendering service to the government, to the armed forces, and, above all, to the people of these United States.

Eye Protection in the Defense Industries*

Joseph A. Haller

THIS article points out the three E's of accident prevention work—engineering, education, and enforcement—emphasizing especially the latter two in the prevention of eye accidents in industry.

ON THE subject of eye protection much has been written, much has been said, much is known; and if only a small percentage of this knowledge would be put into practice by the defense industries, a large number of eye injuries would be prevented—resulting in a large increase in the production of essential materials. I should like to repeat this again to emphasize the fact that if information, available through organizations such as the National Society for the Prevention of Blindness and similar local or state organizations, would be utilized, would be adopted, would be put into use by industry, 90 per cent of the eye injuries in industry could be prevented—yes, even 98 per cent of the eye injuries could be prevented; and at the same time many other types of injuries would also be prevented. Please note that I say injuries, and not accidents. An accident is the term generally used today to refer to an injury which is the result of an accident. Yet many of them are not the result of an accident—in the true sense, many of them are bordering on the criminal. An accident is something unforeseen, unexpected. We know if a person repeatedly uses an abrasive wheel without goggles, or chips steel without goggles, that person will sooner or later receive an eye injury (more likely sooner). The same logic tells us that an unguarded pit is a hazard no matter how careful the employee may be. (More about this pit later.)

I should like first very briefly to review safety or accident pre-

* Presented at the Biennial Conference of the National Society for the Prevention of Blindness, New York City, December 5, 1941.

vention work. It was not until the turn of the century, 1910–1914, at which time the various states enacted compensation laws, that management began to realize it was good business to prevent accidents. True, management has always considered it the human thing to do. Employers did not then and do not now want to see any of their employees needlessly injured, but until the passage of the compensation laws they did not give the subject of preventing accidents serious consideration. It was not thought to be a part of their job. They did not have the incentive. Under the old laws, if negligence on the part of the injured employee or fellow employee contributed in any way to the accident, the employer was not legally responsible; consequently the employer easily developed the attitude that the accident was due to carelessness. This resulted in the error of not having a thorough investigation made to determine the real cause of the accident. Unfortunately, this is still true today in many places of employment.

Frequently the employer is too quick or reaches the conclusion too easily that an accident is due to carelessness. I realize that it may be difficult or impractical at all times to erect guards or barricades around a temporary, open pit or hole in the floor, but when the pit is left unguarded in a dark or dimly lighted passageway for the nearsighted employee to fall into, then I say it is criminal, and the term "accident" is misleading. Yet I have heard employers say the injured man was careless and did not look where he was going. I am glad to say, however, this is not the attitude of all employers.

Much has been written by representatives of some of the larger, more progressive industrial concerns showing how the number of accidents in their plant have been reduced, and how eye injuries in particular have almost been eliminated. It can be done, but first management must have the right attitude. It must have the desire and the will to eliminate accidents. It must do its part in a visible manner. It must make the physical plant safe. The employees will then gladly co-operate. As stated above, the information as to how needless eye injuries can be eliminated is available through such organizations as this. Concerns which have successfully reduced or eliminated eye accidents in their plant are ready and willing to share their knowledge.

In 1919, when I first became an employee of the safety department of a large steel plant, almost every employee who liked to consider himself a "hard-boiled" steel worker was afraid he would be considered a "sissy" if caught wearing goggles, no matter how hazardous the job might be. It was no easy task to overcome this attitude, but through the years, I am glad to say, it has been almost accomplished. While no longer in the employ of this plant, I understand employees all have their individual pair of goggles, and would not think of performing a hazardous job without wearing them. Needless to say, this plant has considerably reduced their eye injuries.

A few years ago we heard much about the three E's of accident prevention work—engineering, education, and enforcement. They are just as essential today. The first and most important of these is engineering. Under this would be the proper design and construction of the plant for safe working conditions; a continuous study of plant layout and processes; and very often the substitution of non-toxic materials for poisonous materials.

Before discussing the prevention of eye injuries, it might be well to consider briefly these injuries. Statistics concerning injuries and eye injuries in particular are based on reports, which, at best, are brief and often inaccurate in necessary information. These reports frequently do not contain the extent of disability, nor the true cause of the accident. Reports covering traumatic injuries are probably more accurate than are reports covering injuries or diseases due to poisonous substances, etc. The latter are more insidious and less spectacular in their action, but just as disastrous. Also I believe a much larger percentage of the former type of eye injuries is covered by reports to the State Compensation Commissions. For this reason alone I think our statistics are on the conservative side. The late Louis Resnick, in his recent book, *Eye Hazards in Industry* (a book which I am delighted on this occasion to commend to you for your consideration and study), estimates the actual cost to employers of industrial eye injuries to be $110,000,000 annually. The cost in money (to say nothing of misery and after-effects) to the employees is almost as great.

What are the causes of eye injuries, conservatively estimated to number 300,000 annually, which cost such a staggering sum of

money and untold misery, spoil material, reduce operating efficiency, and cause a loss of manpower so necessary for the production of essential materials? Without the intention of answering the question as to the cause, I should like to recite an analysis, by the National Society for the Prevention of Blindness, of how eyes are injured: Flying bodies, 80 per cent; tools or machinery, 8 per cent; splashing liquids, 7 per cent; explosives, 2.5 per cent; falls, 2 per cent; and infections, 0.5 per cent. These figures would tend to indicate that toxic materials or substances either are not a big hazard or that reports covering such injuries are not filed with State Compensation Boards. As previously stated, I believe the latter to be the case.

As previously stated, approximately 80 per cent of the traumatic eye injuries are caused by flying particles. If the hazards can not be eliminated, the best protection from flying particles as well as dust, chemical fumes, splashing metals, and injurious radiation is the individual use of the proper type of goggles. By proper type, reference, of course, is made to both the lenses and the frame. Goggles should be properly fitted to the workman, and always supplied individually—never hung on a machine for common use. Facilities should be provided for frequent sterilization. Goggles for general or common use should be outlawed, the same as the old roller towel and common drinking cup. I shall not attempt to list the occupations where men are exposed to the hazards of flying particles because most all employees in industrial concerns today are exposed to this hazard, some more than others. I should not say anyone in an industrial plant is not exposed to the hazards of flying objects. With reference to the proper type of goggles for protection against a heavy blow, both the lenses and the frame must be strong enough to resist shock, and the lenses should not shatter under a blow. On the other hand, where the particles are in the nature of a dust, strength is not important. For protection against fumes and acids, a different type of goggles should be used. For protection against injurious radiant energy, such as ultraviolet and infra-red lights, encountered in acetylene burning and welding and in electric welding, goggles should be equipped with colored lenses of the proper shade to filter or absorb the injurious rays.

Proper protection to the eyes of employees who must wear cor-

rective or prescription glasses can be provided in a number of different ways. I believe the best way is to supply goggles equipped with corrective lenses protected by a cover lens; or by supplying goggles which can be worn over the corrective glasses.

The *American Standard Safety Code for the Protection of Heads, Eyes, and Respiratory Organs* is a handbook of the National Bureau of Standards describing the proper types of goggles, face masks, helmets, and hoods, for different hazards, as well as the specifications for tests which must be met to insure that these protectors will adequately fulfill their purpose. Detailed information on the subject of the use of goggles may also be obtained from the National Society for the Prevention of Blindness and the National Safety Council.

Only a brief sketch has been given on the protection of eyes from traumatic injury, as I desire also to speak briefly on another phase of my subject, namely, conservation of eyesight.

Conservation of eyesight is often overlooked entirely by management. Plants are constructed and buildings erected with only minor attention to seeing or lighting conditions. I know of buildings erected years ago with glass windows for admitting natural light to supplement artificial light, but the windows have never been cleaned. Lighting systems in the past have been installed which never did give sufficient illumination. Yet, in addition, management frequently permits such a system to function at an even greater reduction of efficiency because of accumulation of dust and dirt. It has been estimated that 15 to 25 per cent of all industrial accidents are due to poor lighting. It is rather difficult to arrive at a true estimate because it is difficult to determine the true cause of an accident from reports filed with the state accident commissions. Many accidents which are assigned to other causes are frequently due to poor lighting. If in addition to the accidents due to poor lighting those accidents due to defective eyesight are included, then I believe 25 per cent would be a very conservative estimate. Good lighting not only decreases the hazards of accidents and increases production, but also conserves the health and eyesight of employees.

In our national crisis today it is more essential than ever before to conserve every ounce of manpower. The National Society for

the Prevention of Blindness has a pamphlet by Dr. Ellice M. Alger, entitled, "Sight Begins At Forty." Dr. Alger tells us the discouraging thing of this period of life is the gradual failure of the eyes; that age brings its own eye problems, quite different from those of youth; that the eyes tire sooner than they did; and that vision is not so automatically clear. A child has the keenest of distance vision and at the same time can read the finest print held close to the eye. He can do this because he has a lens in his eye as clear as a crystal and as elastic as a rubber ball, so that it adjusts itself without effort. As he grows older the lens may remain transparent but it becomes more and more inelastic. This inability of the aged eyes to focus is called presbyopia, or "old sight." There are other diseases of the eyes which tend to develop as people get older. These diseases of the eyes of the older workers make their "seeing time" and "reacting time" both slower. This decreases efficiency and increases accidents.

In our defense program today, with a dearth of skilled workers, the aging worker and the men who have not been working for a number of years have all been called back into industry. This makes it of paramount importance that adequate illumination should be provided. It is equally important that every worker needing corrective glasses should have them. It goes without saying that an employee cannot do his work efficiently unless he can see clearly without strain what he is doing. No matter how skilled the mechanic may be or of what quality the tools, if he is 50 per cent blindfolded due to uncorrected defective vision, an all-out efficient job cannot be done.

From the information given in *Eye Hazards in Industry*, I believe it would be conservative to say at least 50 per cent of all workers in industry over 40 years of age have subnormal vision, a great deal of which could be corrected by the use of proper glasses. One employer reports that after supplying 20 per cent of his employees with corrective glasses and installing an improved lighting system, quantity output was increased 19.5 per cent and the quality was improved 16.2 per cent. This is only one of many similar reports of increased operating efficiency due to increased lighting and the use of corrective glasses by employees with defective vision. We have no way of knowing just how many accidents were prevented

at the same time, but we do know that inability to see quickly, due to poor lighting and defective vision, has caused many accidents. There may be some question as to the percentage of workers with defective vision which might be corrected, but there can be no question as to whether defective vision reduces efficiency and increases accidents. In my opinion every employer owes it to his business to discover every case of defective vision among his employees and to assist in having such defects corrected whenever correction by glasses or otherwise is possible. Correction of refractive errors, treatment of diseases and operations where necessary would require the expenditure of money, but such an expenditure must be regarded as an investment to insure the health and efficiency of the workers. It is possible that some equitable arrangement could be made whereby the employer and employee would share this expense.

The more study given to accidents, and eye injuries in particular, the more puzzling it seems to be as to why more pecautions have not been taken for the prevention of such injuries. The only conclusion which can be reached is that employers do not realize the hazards or the cost of accidents.

In summarizing I should like to emphasize the following:

1. It is possible to prevent 98 per cent of the estimated number of 300,000 eye injuries which cost employers about $110,000,000 annually.

2. The use of the proper type of face shield or goggles will prevent most of the traumatic injuries to the eyes, due to flying solids or liquids and radiant energy. The use of goggles is practicable and feasible.

3. At least 25 per cent of all accidents are due to bad lighting or a combination of poor lighting and subnormal vision. Therefore, adequate lighting and prescription glasses will not only prevent eye injuries, but also many accidents resulting in all types of injuries. Adequate lighting and prescription glasses, without question, will increase operating efficiency. At the same time, the older worker will be able to continue effectively at tasks vitally needed in our defense program.

The most important thing about living is life. The greatest tragedy is the loss of eyesight due to avoidable, accidental injury.

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Legibility in Comic Books

Matthew Luckiesh and Frank K. Moss

CONSIDERING the subject of comic books merely from the point of view of visibility, the authors conclude that "unless comic books can be greatly improved from the viewpoint of visibility and readability, they should not survive."

MANY persons interested in conserving the eyesight of children have expressed concern over the severity of the visual tasks in so-called comic books. The lettering is commonly poor and of small size. The printing and paper are generally of poor quality. In addition to these undesirable characteristics, the lettering often possesses a colored background which reduces the contrast and, therefore, further reduces the visibility of the lettering. In many of these books small body-type is used to print paragraphs and even full pages.

All this is contrary to the progress which has been made in the use of larger type and better printing in books, particularly in school books. All the arguments which have been properly directed at poor typography in school books are applicable to the avalanche of comic books which has descended upon the children of today. It is obvious that some publishers of comic books are conscious of the commonly low quality of lettering, paper, and printing which combine to produce severe visual tasks. As a consequence, in a small percentage of the comic books the lettering is larger and better done and the paper is fairly white, possessing a higher reflection-factor than the poor newsprint usually used.

Two groups of specimens, designated as *Average* and *Superior*, were subjected to detailed study and measurements. Each group consisted of 24 specimens, carefully selected to be truly representative.

The *Average* group was selected from a large number of run-of-

the-mill comic books comprising the common "library" or "hoarding" of typical children. Some of these specimens represented approximately the largest and best lettering in these books. However, most of the specimens in this group were selected to represent the more severe visual tasks, although by no means were the selections predominantly the obviously worst ones.

The *Superior* group was selected from three comic books whose publisher had given particular attention to increasing the quality of lettering, paper, and printing. Their superiority over the *Average* group is obvious; however, actual measurements reveal the limitations of mere introspective appraisals.

The Luckiesh-Moss Visibility Meter is readily applicable to the measurement of the visibility of the lettering and other reading matter in comic books. Furthermore, the versatility of this device and technique is also illustrated by the ease with which these fundamental measurements can be translated into equivalent type-size and into the level of illumination necessary to make each individual specimen have the same visibility as a given standard. The meaning of the actual visibility measurements is adequately discussed elsewhere. Here it is sufficient to state that the unit and scale of visibility are clearly definable in terms of the size, in minutes visual angle, of a standard parallel-bar test-object which is barely visible under the same conditions as the actual visual task, such as the lettering. For those who are not interested in the fundamental basis of the visibility measurements, the latter are translated into other terms which are more readily visualized and demonstrated.

For this purpose a standard specimen of printed matter is used in all the comparisons. This is 12-point Bodoni Book type, well printed with non-glossy ink, on non-glossy white paper of excellent grade. This standard of comparison was illuminated by 20 foot-candles. Certainly this visual task is a conservative one both in type-size and in level of illumination, especially for children.

In making the measurements of visibility all specimens of lettering, including the standard printed matter, were illuminated diffusely by 20 foot-candles. Perhaps the measurements are more readily comprehended by referring to the average results obtained for the two groups of specimens. These are presented in Table I.

TABLE I.—Averages of 24 specimens from an *Average* group of comic books and of 24 specimens from a small *Superior* group compared with the standard 12-point Bodoni type

Averages	*Average Group*	*Superior Group*	*Standard 12-Point Bodoni Type*
Actual visibility	3.2	6.7	9.0
Per cent visibility	36.0	74.0	100.0
Equivalent type-size	5.6	9.8	12.0
Foot-candles for equal visibility	150.0	30.0	20.0

The average visibility of the *Average* group was 3.2. This means that the average visibility of the 24 specimens of the *Average* group is the same as that of our standard test-object when it was only 3.2 times larger than the smallest which is recognizable. The smallest standard test-object which is barely recognizable by persons possessing normal vision, under the conditions of calibration of the Luckiesh-Moss visibility meter is about 1.0. Actually this means a visual size of one-minute visual angle, although the reader need not bother about the definition of our unit of visibility any more than he bothers about defining a quart, or a pound.

Referring to Table I, it is seen that the average visibility of the *Superior* group is 6.7 compared with 3.2 for the *Average* group. Obviously this means that the average visibility of the former is equivalent to that of an object (actually our standard) twice the size of that which would represent the average visibility of the *Average* group. It will be noted that the visibility of the standard 12-point Bodoni Book type, under the same conditions as the specimens from the comic books, is 9.0. Thus one may visualize the results by assuming any object, such as the capital letter *E*. The actual visibilities of the *Average* group, of the *Superior* group, and of the standard of comparison (12-point Bodoni Book type) are equivalent to the letter *E* of three different relative sizes of about 1, 2, and 3, respectively.

The second item in Table I may help further in visualizing the actual visibilities. These have been reduced to per cent visibility. It is seen that the average visibility of the *Average* group is 36 per cent of that of the standard of comparison and that of the *Superior* group is 74 per cent of the visibility of the standard.

The visibility of a specimen of lettering, of printing, or of any object or task can be translated into other factors. For example, equivalent type-size is readily visualizable by any one familiar with type-sizes. The standard of comparison is 12-point Bodoni Book type, well printed with non-glossy black ink, on non-glossy white paper of excellent quality. The average visibility of the *Average* group is equivalent to the visibility of 5.6-point type (Bodoni Book) when ink, paper, printing, and illumination are the same as those of the standard. The higher average visibility of the *Superior* group is revealed by its equivalent type-size of 9.8 points. These values are presented in Table I.

Another way of visualizing the differences in visibility is in terms of the level of illumination (foot-candles) necessary to produce the same visibility. The visibility of the standard 12-point Bodoni Book type when illuminated by 20 foot-candles is attainable for the average of the *Superior* and *Average* groups of specimens when they are illuminated by 30 and 150 foot-candles, respectively.

Thus it is obvious from measurements that the *Average* specimens are in general far more severe visual tasks than the *Superior* specimens. Although the *Superior* group represents a great improvement over the *Average* group, even the former, in general, falls short of suitable printed material for children. The average size of the type used in newspapers for body-text is 7 point. This is small type for children for whom textbooks and other books are commonly printed with 12-point type, and even larger type. Still, the average equivalent type-size for the *Average* group of specimens is less than 6 point. Furthermore, all these measurements are referred to a basic illumination of 20 foot-candles for the 12-point type used as a standard of comparison. This is a currently recommended level of illumination for schools and may be considered conservative according to our modern knowledge of seeing.

In Table II are presented the data pertaining to each of the 24 specimens in the *Average* group which were selected from run-of-the-mill comic books. Each specimen is briefly described. The reason for the low average in Table II is obvious from examination of the data for the individual specimens. The relative visibilities in terms of the standard 12-point Bodoni type are generally low. All but three of the 24 specimens have visibilities less than 50

TABLE II.—Data pertaining to each of 24 specimens (*Average* group) selected from a large number of comic books. Comparison is made with 12-point Bodoni Book type, well printed with black ink, on non-glossy white paper of good quality.

	Relative Visibility		*Equivalent Type-Size*	*Foot-candles for Equal Visibility*
	Actual	*Per Cent*		
Standard 12-point Bodoni....	9.0	100	12	20
Lettering and background				
1. Good on white.....	4.4	49	7.2	65
2. Small on white.....	2.8	31	5.2	195
3. Very small on white....	1.9	21	3.9	800
4. Small on white.....	2.3	26	4.5	400
5. Small on white.....	3.0	33	5.4	170
6. Small on white.....	2.7	30	5.0	230
7. Fair on red.....	3.2	36	5.6	150
8. Good on light blue.....	4.3	48	7.0	70
9. Good on yellow.....	4.6	51	7.4	60
10. Large on yellow.....	5.3	59	8.2	45
11. Small on white.....	3.0	33	5.4	170
12. Small on white.....	2.7	30	5.0	230
13. Small on light green....	2.8	31	5.2	195
14. Small on orange.....	2.0	22	4.1	625
15. Small on light blue.....	2.0	22	4.1	625
16. Small on red-orange....	2.1	23	4.3	500
17. Small on red.....	1.8	20	3.7	1075
18. Small poor on green....	1.6	18	3.5	1500
19. Large on white.....	5.6	62	8.6	40
20. Fair on white.....	4.1	46	6.8	80
21. Fair on white.....	3.8	42	6.4	95
22. Fair on white.....	3.3	37	5.8	130
23. Type on poor newsprint.	4.4	49	7.2	65
24. Small type on newsprint	2.6	29	4.9	275
Average, 24 samples.....	3.2	36	5.6	150

per cent of that of the conservative standard. All but three have equivalent type-sizes less than that of average newspaper body-text (7 point). If the visibility of these specimens from average comic books were to be raised to that of the standard, solely by increasing the level of illumination, most of them would have to be illuminated by more than 100 foot-candles. It will be noted that the low visibility of some of the specimens was due chiefly to small size of lettering or type and low contrast, due to colored back-

ground. In all cases the poor quality of paper and printing contributed to low visibility.

Among the economic considerations in the publication of comic books are such factors as cost of paper and of printing. All other factors which contribute to low visibility and, therefore, to poor readability can be improved without increasing the cost permanently. Some conclusions can be drawn rather safely for run-of-the-mill comic books.

Conclusions

The character of the lettering should be greatly improved. Small size should be abandoned. The lettering should be vertical, done in straight lines, and with adequate spacing between the lines.

The use of backgrounds of dark colors (low reflection-factors) should be abandoned because they greatly decrease the contrast between the lettering and its background. The lighter colors, such as yellow, are not so bad in this respect. However, the safest procedure is to use no color in backgrounds for type and lettering.

Inasmuch as it has been found to be economically possible to employ fairly good paper and printing in books for children—and in a few comic books—it does not appear unreasonable to suggest improvement in these factors in all comic books.

Many details could be discussed to advantage, but improvements in the foregoing are so readily achieved that they represent appropriate starting points. Anyone who will study and comprehend the data in Tables I and II cannot avoid the conclusion that most comic books represent a great step backward in the matter of safeguarding the eyesight of children. That the severity of these visual tasks can be reduced is obvious from these data and from more complete studies of reading as a visual task. Resentment against the comic book as a visual task is increasing. Revealing data, such as those presented herewith by means of measurements and techniques, should awaken parents and publishers. Everyone interested in reading matter for children should give attention to this matter. Unless comic books can be greatly improved from the viewpoint of visibility and readability, they should not survive. The measurements and interpretations presented in this study provide factual evidence which publishers should neither excuse nor escape.

The Specialization of Conservation of Vision in Institutional Nursing*

Cora L. Shaw, R.N.

PRESENTS the various aspects of sight conservation as related to institutional nursing—in the out-patient department and in the hospital—and discusses the education of the student nurse in eye hygiene.

THE term nursing has been interpreted recently as health conservation in its broadest sense. With the acceptance of this interpretation by educators in the field of nursing, greater emphasis is placed now on the prevention of disease, health development and preservation. In the nursing world there is need for an increased interest in the conservation of vision as a part of this effort. The nurse doing specialized nursing work in a hospital on the eye service, or in the out-patient department, is neither fulfilling her responsibilities, nor availing herself of her opportunities, if she does not include the conservation of sight as an integral part of that work.

In hospital situations most of the nurse's contacts are with patients suffering from eye diseases. Here the task at hand requires that she give the patient the best specialized nursing care and that she do her part in the restoration of vision and the relief of symptoms. The nurse must then have a thorough knowledge of the development and function of the eye, the cause of disease, symptoms, treatment, and nursing attention. She must understand the approach to patients with visual impairments or those with only temporary loss of sight due to local treatment. She must be conscious of the necessity for maintaining a quiet, cheerful atmosphere.

* Presented at the Institute on Conservation of Vision, Syracuse, New York, October 7, 1941, under the auspices of the New York State Commission for the Blind, in co-operation with the New York State Nurses Association (District No. 4).

Yet the specialized nurse should ever be aware of the necessity for mental diversion. It is her obligation to provide it for the patient. Such diversion is particularly important during the period of treatment. Outside stimuli taken in by the eye are necessarily excluded at this time and eye patients are inclined to draw within themselves, becoming mentally depressed. The nurse should also be extremely gentle, patient and observant. She should be skilled in the performance of nursing procedures for the treatment and comfort of the patient. Thus equipped, a nurse can ably assist the ophthalmologist in preventing loss of sight and in restoring the proper function of the eyes.

But, if she uses her knowledge, understanding, and skill only to aid in the care of the existing eye condition, she has fallen far short of her purpose. The patient and his family are acutely interested in the cause of his disease. We have all heard patients say to the physician when he has given his diagnosis, "Doctor, what is the cause of that?" or "How did I develop such a condition?" Questions frequently come from the parents and other members of the family. There is no more fertile ground for the seeds of conservation of vision than in the receptive minds of such people. The nurse strategically located on the eye ward and in the eye out-patient department can carry out a far-reaching, active teaching program.

In the Out-Patient Department

In the out-patient department the nurse sees many patients whose complaints are relatively minor, but who have conditions which require constant observation and treatment by the ophthalmologist. For example, certain insignificant symptoms of the patient with early chronic glaucoma are not alarming or distressing to him. Nevertheless, the nurse should take time to explain in detail that these disregarded symptoms are occasionally the first warning of serious trouble. The entire progress of the disease may be prevented through an explanation of the treatment prescribed, with emphasis on the doctor's instructions for return visits.

To a patient the suggestion of necessary surgery of the eye is a fearful experience. In the out-patient department the nurse frequently allays the patient's fears to a point where he will be able

to enter the hospital in a desirable mental state. A patient thus prepared reacts more satisfactorily to surgery and hospitalization.

Likewise, the nurse in the out-patient department has numerous opportunities to teach parents about the care of their children's eyes. She should endeavor to learn the reading habits of the children and advise their families on the correction of faulty customs. The importance of good hygiene as well as the need for adequate diet and rest should also be impressed upon parents. These are all factors in sight conservation.

In the Hospital

Any period of hospitalization carries to the patient and his family more or less of an educational message, which may be accidental or incidental. A definite program of education could well be evolved, however. The daily contacts of the institutional nurse provide her with an opportunity of reaching a large and varied group in the community. She can and should impress upon the minds of these people the necessity for regular examinations by an ophthalmologist, the seriousness of neglecting treatment, and the importance of general good physical and mental states in maintaining eye health.

Diet as a factor in eye efficiency has not received the attention it deserves until recently. While administering the patient's diet in the hospital, the nurse should instruct the patient on the value of vitamins and call to his attention the eye conditions resulting from lack of vitamins and undernourishment. This is an opportunity for the nurse to instruct the patient in the selection of a balanced diet. Patients, with both eyes covered, may react unfavorably to being fed. A description of the tray, its contents and arrangement, arouses the interest of the patient in his meal. The tactful nurse can make meal times a pleasant period to which the patient looks forward.

There is a tremendous amount of misinformation and folklore related to the eye. The need for re-education is great. It is true that excellent printed material is available on this subject for public consumption. However, many of the group found in a hospital ward are not familiar with educational literature of this type. Yet the patient's confidence in the nurse enables her to correct number-

less misconceptions as well as to stimulate an interest in literature promoting health education, such as that published by the Department of Health and the National Society for the Prevention of Blindness and many other organizations.

The sympathetic and understanding nurse is the one in whom the patient confides his economic and social problems. Frequently these factors contribute to the loss of vision. As a part of the nurse's store of knowledge in such matters she should be familiar with the various agencies in the community equipped to provide assistance. Also the economic aspect of visual defects and the cost of glasses should be understood by the nurse. Moreover, she should make it possible for the patient to avail himself of the aid at hand. Help of this kind can be administered most effectively through the hospital social service department, but it is expected that a nurse be alert to such problems and refer them to the social service department as they develop.

Through evidencing an interest in the members of the patient's family, the nurse frequently discovers eye needs among them. Oftentimes her influence may prompt them to secure a necessary examination and appropriate treatment.

This education of the patient and his family in the conservation of vision cannot be accomplished by a few hurried admonitions and words of advice as the patient is being discharged. It is a program that should be instituted at the nurse's first contact with the patient and carried on throughout his hospital stay. Neither should it take such form that the patient will develop a fear of blindness or an anxiety neurosis. Rather, it should be based on sound educational principles. Dr. Jesse F. Williams, Professor of Physical Education, Teachers College, Columbia University, has said: "It is of value to think of health as that condition of the individual that makes possible the highest enjoyment of life, the greatest constructive work, and that shows itself in the best service to the world. It involves keeping the body and the mind at the highest levels, living at one's best and not being satisfied with mere absence from hospital and sick room."*

The study of the eye—its development, health and disease—is

* Jesse F. Williams, *Personal Hygiene Applied*, New York: W. B. Saunders & Co., 1938.

one of the most highly specialized fields of medicine. Because of this fact its study has been left almost exclusively to those specifically interested and engaged in that field. While we may agree that it must remain a fine specialty, we also recognize the need for interest, knowledge and assistance from all those groups who contribute to the advancement of general good health.

Education of Student Nurse in Eye Hygiene

To obtain a maximum of assistance in conservation of vision from the nursing profession it is necessary to imbue every student nurse with a fuller understanding of the problem. The student in the hospital spends much of her time learning to care for the manifestly ill, or the individual with a disease. Therefore she is in danger of acquiring a narrow view of nursing. In the educational program of the nurse more prominence should be given to preventive measures and the recognition of early symptoms. Her own health examination can be used as a teaching opportunity. The ophthalmological examination of each student upon entrance to the school is not only a necessary part of the admission procedure, but does much to impress her with the importance of such an examination. In addition to the clinical experience on the eye service, which is a part of the basic course, nurses desiring to do specialized work in the eye field will give the subject more intensive study after graduation. Hence the purpose of the basic course and clinical experience is so to acquaint the student with the subject that she will be intelligently conscious of the importance of eye health, acquire a certain degree of skill in eye nursing, have some knowledge of the cause and prevention of eye conditions, and be familiar with the methods of conserving vision.

After completion of their hospital course many of these students engage in general medical or surgical nursing, public health nursing, school, or industrial nursing. These are the nurses who need and desire a greater knowledge of the conservation of vision. To prepare nurses for opportunities open in this field, the clinical experience of an eye service should provide not only the care of patients with eye diseases, but an educational program which will equip the nurse to do her part in conserving sight.

The eye should be presented to the student as a functioning

organ, with emphasis on preventive measures and the consideration of disease, both from the point of view of loss of function and the methods of treatment, as a means of restoration of sight or prevention of further deterioration. The interdependence between eye health and general health should be stressed in teaching the relationship between conditions, as, diabetes and lens changes, hyperthyroidism and exophthalmos, central nervous system diseases and visual changes, syphilis and keratitis, kidney disease and retinitis, et cetera.

During prolonged febrile diseases and throughout convalescence from debilitating illness, the eyes merit careful attention. If the student understands the necessity for care and the consequences of its omission, she will be more alert to the problem when it arises in patients under her supervision.

The study of drugs used in examination and treatment of the eye provides an excellent opportunity to re-emphasize the danger of the use of strong solutions and the safety measures to prevent the introduction of such chemicals into the eye. Here again is an opportune time to recall the use of silver nitrate as a prophylaxis for the eyes of the newborn.

Certain toys in the hands of children become a serious eye menace. By recognizing the potential danger of these playthings which may injure the eyes, the student renders a valuable service in her capacity as parent counsellor.

The emergency treatment of burns, foreign bodies, and other injuries to the eye should be familiar to the student. She is thus enabled to carry out the required treatment skillfully when such emergencies are encountered. Other matters, as lighting, diet, rest, importance of regular ophthalmological examinations and the recognition of early symptoms, all need more emphasis in the student's curriculum.

Conclusion

I have not attempted to outline a complete course of study for the student on a hospital eye service, but rather to call attention to some of the points which are more frequently overlooked. Perhaps the urgent need for nursing care required by patients may be the cause of this apparent neglect. Yet a student should not be ex-

pected to take full responsibility for specialized care in her brief period of experience. A teaching program of this intensity can be carried out only with a stable staff of experienced graduate nurses to bear the bulk of the responsibility.

Nursing education in all fields must include prevention of disease, health development, and maintenance. The atmosphere provided by an eye service is an excellent one in which to impress upon the minds of the students the extreme importance of these aspects of eye nursing. This achievement will result in a more widespread knowledge of eye health among nurses, making available to the community a greater number of nurses prepared to assist in sight conservation. If we who control the education of the student in this field will keep our minds alert to our aim, we shall expand our program to include time and effort in the interest of conservation of vision.

Report on the Glaucoma Campaign*

Mark J. Schoenberg, M.D.

PROGRESS report of the work of the Society's Committee on Glaucoma.

LAST year the National Society for the Prevention of Blindness decided to initiate an active campaign for the prevention of blindness from glaucoma. The impetus for such action had already been given by the late Dr. Park Lewis, one of the founders of the Society. After his death in the fall of 1940 I was honored by being asked to take the chairmanship of the Committee on Glaucoma, and I take this opportunity of submitting this report of activities during the past year. Any progress made is the result of the tireless efforts of the membership and the Society's staff.

At the outset it was realized that the difficulties we had to overcome were four-dimensional.

The first and chief difficulty was to clarify the need for such campaign and formulate its objectives. The second was to overcome the general indifference and apathy toward a problem which involves a great deal of effort and work. The third was to secure the co-operation of those who would be indispensable if we want to assure a successful outcome of the campaign. And the fourth problem was to attain for ourselves, the medical profession, and the public at large an optimistic viewpoint—absolutely necessary if victory is to be won.

First Step

The object of our task is, as was stated at the beginning of this report, to help reduce the percentage of blindness from glaucoma. One of the methods decided upon for attaining our objective was

* Presented at the Biennial Conference of the National Society for the Prevention of Blindness, New York City, December 4, 1941.

a campaign to bring about improvement of clinic services. As to the need for such, we had only to consult our own personal experience and that of many ophthalmologists who have spent several decades in eye clinics. Additional proof was furnished by surveys of clinical facilities and glaucoma records of a number of busy eye clinics in and outside of New York City. These surveys brought to light many weaknesses and shortcomings that pointed to the urgent need for remedial measures.

Second Step

Having ascertained certain facts, we started out in organizing a Committee on Glaucoma, consisting of one prominent ophthalmologist from each eye institution located in Greater New York and of representatives from certain related and professional groups whose responsibility it would be to demonstrate what might be accomplished through united efforts and standardization of procedures. We had a very pleasant experience in that the response to our invitation to join the committee was most enthusiastic. Not one refusal was received! This proved that the time for action was fully ripe.

Third Step

As the organization of the committee proceeded, a plan was submitted to it for the introduction of a special glaucoma service in clinics. The plan has been unanimously accepted. A printed form for glaucoma records, containing the most important items necessary for establishment of the diagnosis of glaucoma and the therapeutic indications, was also submitted and adopted. Each representative on the National Society's committee undertook to appoint in his institution two or more ophthalmologists, as well as a representative of the social service department when available, to assume responsibility for securing complete data.

Fourth Step

Medical boards and other authorities were asked to approve and support the innovations mentioned above. Already, some of the institutions have acted favorably upon the matter and are promis-

ing moral support. We are confident that the remaining eye institutions will act in a similar spirit.

Fifth Step

We are gratified to announce that others who have joined the committee directing this local demonstration and campaign against glaucoma are representatives of the New York State Bureau of Services for the Blind, the United Hospital Fund, hospital trustees, and eye hospital superintendents.

Sixth Step

Recently, a conference of social workers from the New York eye institutions was held at the Society's office for the purpose of familiarizing this group with the objectives of the glaucoma campaign. An animated discussion took place, which helped considerably to clear up a number of obscure points.

Seventh Step

The establishment of contacts with the public, general practitioners, and other groups directly or indirectly concerned with the successful issue of the glaucoma campaign was begun. Radio broadcasts on glaucoma have been given by Dr. C. Gregory Barer, of the National Society's staff, and by Dr. Daniel B. Kirby, a member of the committee. Through the good offices of Dr. Algernon B. Reese of the committee, an article on glaucoma has appeared in *Life* magazine. A pamphlet on glaucoma for general practitioners and one for the glaucoma patient are in preparation. Papers* have been read at the recent annual meetings of the Medical Society of the State of New York, the American Ophthalmological Society, and the American Academy of Ophthalmology and Otolaryngology on: (1) the general practitioner's responsibility; (2) a survey of records; and (3) the problem of preventing loss of sight of glaucoma patients in clinics, respectively. And not the least important is the leaflet containing rules and instructions for glaucoma patients, which has been made available for distribution. It is being asked for every week by physicians throughout the country.

* Available upon request to the National Society for the Prevention of Blindness.

General practitioners, numbering about 185,000 in the United States, are seeing hundreds of thousands of patients daily in clinics and offices. A large percentage of these patients are forty years of age or older—the age when glaucoma is most prevalent. It is our firm belief that the general practitioner can contribute considerably toward the prevention of blindness from glaucoma. He should become familiar with early symptoms and signs of glaucoma, in order to refer suspected cases for treatment at a stage when this can be of greatest advantage. I am happy to report that, following presentation of the paper on this subject at the annual meeting of the Medical Society of the State of New York, the State Bureau of Services for the Blind and its Prevention of Blindness Service expressed the intention of taking up the educational phase of the campaign among general practitioners in this state.

Time and space are too limited to mention other activities, such as the awakening of a keen interest among American ophthalmologists and editors of ophthalmological journals, among members of various ophthalmological societies throughout the United States, etc. Neither is the time ripe to speak in visionary terms about other activities in view: glaucoma exhibits, special glaucoma clinics, a glaucoma research institute, scholarships for research on the various glaucoma problems, the spreading of this entire movement among South American and other countries.

In closing, I wish to express my gratitude to the National Society for the Prevention of Blindness and to the members of the Committee on Glaucoma who have shown such a splendid spirit of cooperation in beginning this greatly needed piece of work—*the campaign for the prevention of blindness from glaucoma.*

Glaucoma Program at the Massachusetts Eye and Ear Infirmary*

Garrett L. Sullivan, M.D.

THE author describes a glaucoma clinic set-up in which the social service department plays an important rôle. The doctor's use of the medical social worker, the duties of the clinic executive, and the follow-up, together with a program of class instruction for glaucoma patients, are included in the discussion.

What is Glaucoma?

Glaucoma is a broad term which signifies a state of increased intra-ocular pressure. There are several types of glaucoma, but by far the most common, and the one to which we will confine ourselves today, is that called chronic simple glaucoma.

Chronic simple glaucoma is an insidious disease of the eyes coming on usually in the fifth to sixth decades of life, affecting both sexes, and, if untreated, usually resulting in blindness. It is bilateral, affecting one eye before the other. Although we do not know the cause, we do understand the mechanism of the disease fairly well. It is unnecessary for me to state to this audience the frequency of blindness coming on in later life due to glaucoma, the large percentage of which is represented by chronic simple glaucoma.

One might aptly describe the disease, especially in its early stages, as characterized by an absence of symptoms and thus we term it an insidious disease. Usually the presenting complaints of the patient are frequently vague and indefinite, and may vary from occasional blurring of vision to vague feelings of discomfort or seeing halos of colors about lights. Therefore, it is evident that, from the history of the patient, we may or may not obtain a clue

* Presented at the Biennial Conference of the National Society for Prevention of Blindness, December 4, 1941.

as to the existence of the disease. For this reason, it behooves the examining physician to be well versed in the signs of glaucoma.

Signs of Glaucoma

There are three cardinal signs of glaucoma: (1) cupping of the optic disc; (2) elevated pressure in the eye; and (3) changes in the visual field. No examination of the eyes is complete without a check on all three points, i.e., examination of the fundus and optic disc, an estimate of intra-ocular tension, and check on the visual field by perimeter and tangent screen. The visual acuity, as measured by Snellen's chart, is usually normal, or nearly so, in the early stages, and quite often even in the later stages, of the disease. Damage to the eye may be demonstrated in the visual field, where constriction of the nasal side may be found, or one may find a sickle-shaped area of blindness surrounding the fixation spot. Such scotomata enlarge gradually and result in greater and greater decrease in the visual field, so that ultimately all vision is lost. Now, because of anatomical and physiological factors, it so happens that commonly one of the last portions of the visual field to be blotted out is the central area, the point of highest visual acuity. It is for this reason that so many victims of the disease are totally unaware of any visual disturbance in the early stages. These changes in the visual field reflect the pathological cupping of the optic disc, and there is a direct relationship between the amount of cupping of the disc and the visual field loss.

Mechanism of the Disease

The tension of pressure within the eye is the immediate cause of all this damage and, as stated, we know more about the mechanism of the disease than we do of the ultimate cause. Briefly, the circulation of fluid in the eye is controlled by a delicately regulated balance between inflow and outflow. Any increase in the rate of inflow or decrease in the rate of outflow is bound to result in an increase of pressure within the eye, dangerous to vision. It is vital, therefore, to the saving of sight in glaucoma that the pressure be controlled. Such control may be exercised in one of two ways, medical or surgical. Each case is an individual one and no rules can be set to apply to all. In general, however, surgery is indicated

sooner or later in most cases, practically always in those under 70 years of age.

We will not concern ourselves with the details of medical and surgical procedures in the therapy of glaucoma. It is sufficient to say that the crux of the glaucoma problem, short of determining the etiology, lies in the early recognition of the disease and institution of proper therapy. The earlier the diagnosis, the better the prognosis, as treatment is aimed at prevention of further loss of vision. Visual damage, already present, cannot be repaired, but it is universally agreed that what vision is still present can be saved in the great majority of chronic glaucoma patients.

Program at Massachusetts Eye and Ear Infirmary

At the Massachusetts Eye and Ear Infirmary, as elsewhere, it has been our aim to preserve vision in the individual by medical and surgical measures. In follow-up of any case of glaucoma, it is certainly important to make frequent determinations of the intraocular tension, and for this reason every glaucoma patient at every visit has his tension taken and recorded. We use the new Schiötz instrument and, in certain cases where this instrument is not practical, the determination is made with the Soutter tonometer. All tensions are performed and recorded by a house-officer who spends his entire mornings, daily, for three months in doing this work, together with doing the most important part of the follow-up of glaucoma, namely, plotting the visual field, peripheral and central, of both eyes.

The field room, as we call it, is staffed every morning in the week, except one, by a member of the visiting staff and the house-officer. On one morning the house-officer carries on by himself. No technicians are employed in this work. One of the main purposes of this arrangement is to supply expert supervision and instruction for the house-officer in the technique and interpretation of visual fields. One cannot overstate the importance of such work in the proper and efficient follow-up of glaucoma. All other tests, including tension determinations, are of secondary importance. An effort is made to obtain visual field examination at least every six months, more often if necessary. This is the ideal toward which we strive, for several reasons not yet realized.

Tension Studies.—It is not rare to encounter some cases who show normal or near normal tensions and yet who have other definite signs of glaucoma. It has been found that frequent determinations of the tension over a 48-hour period, with the patient in the hospital, will show times when the pressure is definitely elevated above normal. Now, a few cases have been studied in this manner, but obviously for economic reasons the plan is not practical on a large scale in an out-patient clinic.

Staff Conferences.—Another facility available to the glaucoma patient is the weekly meeting of the staff where problems of diagnosis and therapy are discussed. In this open forum, the patient is afforded the benefit of the consensus of the staff.

Social Service and Its Rôle

I wish to speak now of the rôle of the Social Service Department in the program at the Massachusetts Eye and Ear Infirmary. In 1931, Dr. George S. Derby, then Chief of Service of the Infirmary, gave an address before the National Society for the Prevention of Blindness in which he cited the invaluable aid to be had from an efficient social service department. As he stated, glaucoma represents a difficult class of cases to handle because sight cannot be restored. Patients feel that they are not getting anywhere, become lax in their visits and in carrying out treatment, and they visit other clinics or drift away into the hands of quacks.

At the Massachusetts Eye and Ear Infirmary Miss Janet Gorton, whose services were first made possible to the hospital through the National Society, has been in charge of the medical social work for the glaucoma patients since 1928. The social worker's function in the clinic under the present set-up is threefold. She acts as social case worker, clinic executive and follow-up worker.

Patients with glaucoma, as with other chronic diseases, are confronted with the problem of long-time and often expensive medical care. Treatment includes the monotonous use of eye drops for life, with the possibility of repeated surgery. In addition, the patient has an underlying fear of blindness and of possible complete social and economic dependence as a result. Many patients with this disease are discouraged, and some have repeated periods of de-

pression, feeling that to continue treatment is futile when no hope can be given for improvement in vision. It is with such patients that the medical social worker can be of real assistance to the doctor in treating the patient. Each patient reacts to the knowledge of his diagnosis and the recommendations for treatment in his own way. Some need little or no help in following the doctor's advice. Others, who fear operations or who are not convinced that surgery is necessary, can be helped to accept surgery through consideration with the social worker of what the operation means to them from every point of view.

Doctor's Use of Medical Social Worker.—It is important for the medical social worker to be used by the doctor with such patients, if full co-operation in treatment is to be obtained. Frequent consultations between the doctor and social worker are necessary in order that the doctor may have some understanding of the patient's difficulties in accepting the medical recommendations and for the social worker to be fully informed of the importance of the medical recommendations for the individual patient concerned. The medical social worker has the responsibility of seeing the patient with glaucoma as an individual and understanding the problems which the disease creates for the patient as opposed to the problems the disease creates for patients in general. Having understood the particular situation, it is then her responsibility to attempt to work out some solution with the patient, whether it be in changing his attitudes toward his treatment or his handicap, or in helping him to make some satisfactory adjustment economically or environmentally through available community resources. These services constitute the medical social case work.

Duties of Clinic Executive.—As a clinic executive, the duty of the medical social worker entails:

1. Seeing that each patient has the necessary tests done before being examined by one of the clinic doctors. This usually means the recording of visual acuity and tension or arranging for visual fields, if they have been ordered.

2. After the doctor has examined the patient she makes certain, by detailed instruction, that the patient understands the directions for the use of any prescriptions for drops or ointment. In any busy clinic the patient frequently is rushed away from the doctor and is

more confused than ever. The social worker, by her instruction, clarifies to the patient just what he is expected to do.

3. Arranging for transportation of elderly and incapacitated people to and from the clinic.

4. Giving interpretation to a responsible member of the patient's family, in order that someone in the patient group may have a complete understanding of the patient's condition and be aware of the importance of his keeping clinic appointments and following the recommendations. Interpretation is also given to many social agencies in the community who need to understand the treatment planned, as those agencies are often responsible for the expense of the patient's medical care or for the direct support of the patient.

Follow-up

The Infirmary has a 100 per cent follow-up program for glaucoma patients which is handled in our set-up by the medical social worker. The follow-up is instituted on the patient's first clinic visit through social review of every patient. Each appointment which is not kept is followed up by letter and through personal visits by either the social worker herself or volunteers under her direction. An attempt is made to remove all practical obstacles which may be preventing a patient from keeping his clinic appointments.

Glaucoma Classes.—For the past two years we have been carrying out a program of class instruction for all glaucoma patients. These classes have been held on an average of once every two weeks from October to June. The attendance is limited to 25 patients from the clinic plus those who happen to be patients in the hospital at the time. We have further encouraged the patients to invite their relatives or friends who might be interested.

The aim of this innovation was to try to convey to their minds, in lay terms, an idea of the mechanism and therapy of glaucoma in the hope that thereby we might be able to remove some of the doubts and fears that beset the minds of these patients and to gain their interest and co-operation in the effort to preserve their vision. The necessity of controlling pressure, whether by drops or surgery, teaching the aim of therapy in the prevention of further loss of vision, and pointing out the best way to regulate their lives and habits so as to live with their disease, are only a few of the many

points covered by these talks. They are afforded an opportunity to ask specific questions which have been on their minds. In the hustle and bustle of a busy clinic, there is insufficient time to answer such questions, and the troubled, uncertain state of mind of many of them has been reflected in the type of questions asked. It has been a surprise to find so many depriving themselves of joy and happiness to be derived through reading and the movies, in the mistaken idea that they are saving their eyes. Needless to say, bizarre ideas relative to diet were also entertained by some. Now it is very difficult to estimate the value of such talks in terms of sight saving, but it seems logical to assume that, by giving the patient a better understanding of his affliction, closer co-operation will be obtained in carrying out recommended therapy. Numerous patients spontaneously expressed their enthusiasm and gratitude for the talks. In connection with these classes, I wish to pay tribute to the fine work performed by the medical social service worker in arranging attendance at the lectures.

These sessions are not only educational for the patient, but also for the doctor. It has been enlightening to find that many patients, for example, are fearful of operation on the strength of that popular fallacy, namely, that the eye is taken out and placed on the cheek during the operation. It is really remarkable the number of people who believe this, and I have often wondered about the source from which it arose. It has been further discovered that the fear of ether has been an obstacle to many. Naturally it takes little time to inform them that ether is not used.

Then there is the story of the patient who had had his eyes taken out and the backs of them "brushed off."

From these few examples it can be readily seen that there is still much ignorance in the layman's mind which must be overcome.

A record of attendance at each lecture is kept and also many of the questions asked. This proves helpful in arranging for subsequent sessions.

This program started as an experiment, and we feel so gratified by the response on the part of the patients that it is now a fixed part of the glaucoma program at the Massachusetts Eye and Ear Infirmary.

Conclusion

Before closing, I wish to present a few figures which indicate that glaucoma is assuming greater and greater importance as a clinic problem.

In his talk before this Society in 1931, Dr. Derby listed some figures to demonstrate the effect of placing a social service worker in charge of glaucoma follow-up work. They are as follows:

1926.....209 active cases 300 follow-up
1927.....262 active cases
1928.....582 active cases (first year of medical social worker)
1929.....740 active cases
1930.....740+ active cases

At this time there was a daily average of 9.8 glaucoma cases in the clinic. Eleven years have passed, and we find that the daily average of glaucoma patients in the clinic has risen to 22. The total number of active cases being followed is roughly 800 (all types). It is interesting to note, however, that since 1936, when 380 new cases were seen, there has been a steady falling off to 296 new cases seen last year and 241 for the first ten months of this year.

The Restoration of Sight and Prevention of Blindness in Kansas*

Harry E. Hayes

AN account of the Kansas State Department of Social Welfare program for the restoration of sight and the prevention of blindness.

AN ATTEMPT will be made in this paper to present the important facts in connection with the initiation, development, and operation of the Restoration of Sight and Prevention of Blindness programs in Kansas which are being carried on by the State Department of Social Welfare. Some of the results achieved and problems confronted will be discussed and a historic approach used in an effort to share more clearly the experience which Kansas has had in these fields.

The Kansas Social Welfare Act was enacted by the legislature in April, 1937, and included conformance with Federal requirements for the category of assistance known as Aid to the Needy Blind.† In addition, under Section 8, which describes the powers and duties of the State Board of Social Welfare, the following enabling clause was inserted:

> "The State Board shall initiate or co-operate with other agencies in developing programs for the prevention of blindness, the restoration of eyesight, and the vocational rehabilitation of blind persons, and may create a department for the blind within the State Board. . . ."

The public assistance programs commanded the immediate attention of the newly organized state welfare agency and it soon

* Presented at the Biennial Conference of the National Society for Prevention of Blindness, December 5, 1941.

† Chapter 39, General Statutes of Kansas, 1939 Supplement.

became apparent, from the instructions issued by the federal Social Security Board regarding the determining of eligibility for Aid-to-the-Blind applicants, that a state supervising ophthalmologist and eye examiners would be needed. Eligibility is partially dependent upon the extent of the applicant's vision, and medical knowledge is necessary to accept or reject applicants properly on this basis and to report on eye conditions.

Consequently, the Kansas Medical Society was requested to appoint representatives to advise with officials of the State Department of Social Welfare on this matter. A meeting followed on July 30, 1937, at which the representatives of the medical society made the following recommendations: (1) that the state supervising ophthalmologist be a part-time employee of the Department of Social Welfare; (2) that his salary be $200.00 per month; (3) that he be allowed to maintain his office in his home community; and (4) that a fee of $5.00 be paid for eye examinations. There was complete agreement with the Social Security Board regulation that eye examinations in the Aid-to-the-Blind program should be made only by doctors of medicine who confined their practice to the eye, or the eye, ear, nose and throat. The representatives of the medical society expressed a great deal of interest in the new Aid program because of the reliable information it would gather regarding the causes of blindness, and the co-operation of the profession was offered in working out the details of the program.

The first step to be taken by the State Board of Social Welfare was the appointment of a state supervising ophthalmologist and the setting up of a panel of examiners. Representatives of the Kansas Medical Society were again invited to meet with officials of the Department of Social Welfare to discuss these questions. The meeting was held and a request made that the medical society name the doctor to be offered the position of supervising ophthalmologist. It was the feeling on the part of social welfare officials that such a designation, being divorced from political implication, would work to the advantage of the program. The medical society felt, however, that it would be more desirable for them to supply a list from which a state supervising ophthalmologist could be chosen and to assist in establishing a panel of examining ophthalmologists.

A list of five or six qualified ophthalmologists was supplied by

the Kansas Medical Society, from which a prominent Kansas City, Kansas, eye specialist was chosen as state supervising ophthalmologist by the Social Welfare Board. He assumed office the first of August, 1937. Simultaneously, a graduate nurse with four years' experience in social case work, part of which was served in a hospital social service department, was appointed on a full-time basis to serve as field secretary to the state supervising ophthalmologist. Her duties were to include the organizing of work for execution by the supervising ophthalmologist, and making contacts with examining ophthalmologists and county departments of social welfare to interpret the program and explain procedures.

Questionnaires then went out from the office of the Kansas Medical Society to the secretaries of all county medical societies in the state requesting the names of medical doctors in the respective counties who limited their practice to the eye, or to eye, ear, nose and throat. As the questionnaires were returned they were checked against the lists of the American Medical Association, the College of Surgeons, Board of Ophthalmology and the Board of Otolaryngology. Notations were made as to the affiliation of the individual doctors with these groups and the questionnaires turned over to the supervising ophthalmologist. He, in turn, sent questionnaires directly to the doctors who had been reported, asking if they confined their practice to the eye, or the eye, ear, nose and throat, and whether or not they did eye surgery. Replies to these questions were received over the doctors' signatures and were placed in the file of the supervising ophthalmologist. Although the receiving of adequate eye examinations for Aid-to-the-Blind was the primary interest at this point, everyone concerned was aware that a treatment program to restore eyesight would probably follow soon, since enabling legislation had already been passed. The supervising ophthalmologist, consequently, wanted as much information as he could secure regarding the individual abilities of the doctors.

A tentative panel of qualified examiners was set up about the middle of August, 1937, which included 94 doctors of medicine, who limited their practice to the eye, or to the eye, ear, nose and throat, and who resided and were duly licensed in the state of Kansas. Although there was not an examiner designated for each of the 105 Kansas counties, there was, fortunately, a wide geographic distribution of examiners.

After consulting with officials of the Department of Social Welfare and the Kansas Medical Society, and corresponding with the Social Security Board, the supervising ophthalmologist drew up a plan of procedure for conducting eye examinations which was approved by the Social Welfare Board. On August 24, 1937, instructions regarding this procedure were sent to all county departments of social welfare and all medical doctors in the state. It was felt in the latter instance that the medical profession in general should be informed of the Aid-to-the-Blind program, since it has definite medical implications and their co-operation was needed. A list of the 94 approved examiners was sent to each county department of social welfare and was published in the *Journal* of the Kansas Medical Society for September, 1937.

Briefly, the procedure for securing eye examinations was outlined as follows: When an application for Aid-to-the-Blind is received at a county department of social welfare, the applicant's eligibility from all standpoints other than the extent of his visual deficiency is determined first. If he is found eligible for public assistance, he is informed that he must submit to an eye examination. A completely free choice of approved examiner is the privilege of the applicant. He is given an authorization form signed by the county director to be presented to the examiner. Following the examination the examiner makes a notation on the authorization form indicating that he has examined the patient's eyes and forwards it to the office of the state supervising ophthalmologist. This constitutes the examiner's claim for the examination fee. It is accompanied by an examination report form in duplicate which bears information coming out of a rather complete ophthalmological examination and which is required by the Social Security Board. The supervising ophthalmologist determines from the eye examination report whether the applicant's visual handicap is pronounced enough to make him eligible for the Aid-to-the-Blind category. He makes a written entry on both copies of the eye examination report regarding the disposition of the case and forwards one copy to the county department of social welfare which referred the case, together with a separate form certifying that through examination the applicant has been found eligible or ineligible for Aid-to-the-Blind.

Re-examinations for applicants applying two or more times for Aid-to-the-Blind or for recipients of Aid-to-the-Blind who have undergone a change of eye condition are handled in this same manner, except that prior authority must be secured from the supervising ophthalmologist before referral for the re-examination can be made.

In the instructions to examiners they were urged to conduct examinations in their own offices whenever possible. An appeal was made for the co-operation of the examiners in obtaining the highest type of examinations, and complete reports. A fee schedule was set up for the payment of five dollars for eye examinations, five dollars for consultations, and five dollars for re-examinations.

The definition of blindness used by the supervising ophthalmologist in determining eligibility for Aid-to-the-Blind is the generally accepted one which is used by most states. An applicant is considered eligible for Aid whose visual acuity is 20/200 or less in the better eye with correcting glasses, or whose visual acuity is more than 20/200 but who has a field defect in which the peripheral field has contracted to such an extent that the widest diameter subtends an angular distance no greater than twenty degrees.

By the first of September, 1937, eye examination reports began coming in from throughout the state to the supervising ophthalmologist. Large numbers were received daily, at first, but the number gradually decreased to a smaller but steady inflow as the visually handicapped persons previously receiving assistance were placed in the Aid-to-the-Blind category.

The supervising ophthalmologist was very busy handling the influx of eye examination reports at this time, but with the possibility of a treatment program in the offing he gave special attention to the treatment recommendations and prognosis noted on the eye examination reports by the examiners. He set up a file placing cases with recommended treatment into three classes:

Class A—Cases eligible for Aid-to-the-Blind in which immediate treatment was indicated.

Class B—Cases eligible for Aid-to-the-Blind in which treatment was recommended but was not of an urgent nature.

Class C—Cases ineligible for Aid-to-the-Blind through the eye examination but for whom treatment was indicated.

Officials of the Department of Social Welfare began thinking concretely about the form a restoration of sight program should take and early in September further advice was requested from the group of officers of the Kansas Medical Society, which had given their counsel previously. The group had offered to serve as an advisory committee to the Department of Social Welfare, but at this point they expressed the feeling that a committee of ophthalmologists could serve better in this capacity. Consequently, a recently organized conservation of eyesight committee of the medical society, composed of ophthalmologists, was designated to act in an advisory capacity.

The first meeting of the Conservation of Eyesight Committee was held September 18, 1937, with the supervising ophthalmologist attending as an ex-officio member. The possible development of a restoration of sight program was discussed, but no definite conclusions arrived at. The supervising ophthalmologist was requested to provide additional information regarding blindness in Kansas from his eye examination reports at a later date.

The supervising ophthalmologist and members of the Conservation of Eyesight Committee attended the American Academy of Ophthalmology and Otolaryngology in Chicago during October, 1937, and had an opportunity of conferring with ophthalmologists from other states regarding problems arising in the Aid-to-the-Blind programs as well as an opportunity to discuss plans of extending these programs to include the restoration of vision. A special meeting was held to discuss these specific matters, which was attended by the deputy director of the Department of Social Welfare as well as the interested Kansas doctors. This opportunity did much to clarify thinking regarding the proposed restoration of sight program in Kansas.

The Kansas Social Welfare Act authorized the creation of the Division of Services for the Blind in the State Department of Social Welfare, and during November, 1937, its organization was undertaken with the employing of a supervisor and assistant supervisor. The supervising ophthalmologist and his field secretary became staff members of the Division of Services for the Blind. On the recommendation of the Conservation of Eyesight Committee the

term of office for the state supervising ophthalmologist was later limited to 18 months.

The newly created Division directed its efforts along the lines already started, with the establishment of a restoration of sight program as the first objective. It was legislatively empowered to function also in the areas of preventing blindness and providing vocational rehabilitation, but restoration of sight activities appeared to be the logical starting point because figures were becoming available showing a need for restorative treatment among Aid-to-the-Blind recipients. In addition, it seemed reasonable that any program for the blind should include facilities for correcting or minimizing the physical handicap and such service should precede efforts to assist individuals in making adjustments to their handicaps.

The question of how the proposed restoration of sight program would be financed presented a problem which was not quickly solved. It was first thought that since no appropriation had been made by the legislature for the functions delegated to the Division of Services for the Blind that financing would have to be done in the same manner used for public assistance grants, that is, on a federal, state, and county matching basis. However, on December 8, 1937, the Department of Social Welfare set aside an amount not to exceed $50,000 of administrative funds to be used for the restoration of sight, prevention of blindness, and rehabilitation. Of this amount, $25,000 was later designated for the conducting of a restoration of sight program, and approval of this type of expenditure was secured from the attorney general of the state.

The Division of Services for the Blind staff went to work in earnest to prepare definite plans for the restoration of sight program and members of the Conservation of Eyesight Committee were approached individually for advice during the following weeks. By early January, 1938, the plans had taken fairly complete form and the supervising ophthalmologist requested the chairman to call a meeting of the Conservation of Eyesight Committee to consider them. A meeting was held January 9, 1938, at which the supervising ophthalmologist reported on the contemplated medical program. The plan as outlined was approved by the committee.

The next few months were taken up with preparing necessary

forms and a final draft of instructions regarding the restoration of sight program for the county departments of social welfare and the ophthalmologists throughout the state. Since the program was to be integrated into the Department of Social Welfare, the procedures had to conform to those previously established where parallels could be drawn, and step by step forms and instructions were cleared with other divisions of the Department of Social Welfare. Much help in preparing the operating methods of the new program was given to the staff of the Division of Services for the Blind by individual members of the Conservation of Eyesight Committee and the executive secretary of the Kansas Medical Society.

The instructions regarding the procedure to be followed in the restoration of sight program were completed in detail in April, 1938. However, since the program was to be largely a medical program, the State Department of Social Welfare submitted the plan of procedure to the Kansas Medical Society for the approval of that organization. Prior approval had been secured from the eye specialists, but the co-operation of the profession in general was felt desirable. The executive committee of the medical society studied the plan and gave their endorsement of the program.

On April 14, 1938, instructions regarding the procedure to be followed in the restoration of sight program were sent to all county departments of social welfare and all approved examining ophthalmologists in Kansas. The following description of this program was set forth in the instruction, and the plan outlined has been followed up to the present time.

The restoration of sight program is designed to promote the restoration of vision among recipients of Aid-to-the-Blind. The entire cost of this service, including all necessary medical, surgical, and nursing care, hospitalization, drugs, and glasses is borne by the State Department of Social Welfare. The county departments of social welfare are required only to furnish transportation for the patient to and from the ophthalmologist's office or the hospital.

The list of ophthalmologists approved for participation in this program of treatment is identical with the list of approved examiners for Aid-to-the-Blind. All Kansas hospitals approved by the American College of Surgeons are approved for the extending of care to patients receiving service under the restoration of sight

program. A group of reputable optical companies has been accepted for participation in the extending of service under the program.

Selection of individuals for whom restoration of sight may be attempted is made by the state supervising ophthalmologist from recommendations made by the examining ophthalmologists following examination to determine eligibility for Aid-to-the-Blind. In cases where it appears that the recipient's vision can be restored or preserved through treatment, the supervising ophthalmologist communicates with the county departments of social welfare advising that the cases will be approved for treatment. Approval is also frequently given when the comfort of the patient is all that can be achieved.

The county director or home visitor informs the recipient that treatment is available for him and urges that he consult an ophthalmologist on the approved list. The ophthalmologist chosen by the client is usually the one who made the eye examination, but within practical limits it is stressed that the client has a free choice of an approved ophthalmologist. Compulsion is avoided and the final decision as to whether treatment will be accepted or rejected is freely made by the client. However, it is the duty of the ophthalmologist to explain the eye condition and hoped-for results of the indicated treatment to the prospective patient and give a full account of the possibilities for success or failure.

A set of forms is used beginning with a "treatment agreement" signed by the patient and ending with a state claim voucher on which payments are made for treatment extended. The attending ophthalmologist is responsible for all treatment in a case including the services of co-operating facilities, such as hospitals, laboratories, optical companies, consulting physicians, etc. When treatment has been completed, the attending ophthalmologist reports the progress made and need for future attention in each case to the supervising ophthalmologist.

Under the program it is possible to include general medical care for systemic conditions which relate directly to eye conditions. In these instances the general practitioner is regarded as a co-operating facility in the extending of treatment and works under the supervision of the attending ophthalmologist. However, before general

medical care is extended, an effort is made to secure this service through a community resource.

A schedule of allowable services and the corresponding fees was drawn up by the Conservation of Eyesight Committee of the Kansas Medical Society and approved by the State Department of Social Welfare. The fees represent approximately 50 per cent of the fee usually charged by ophthalmologists for similar services performed in their own practice. For surgical cases the fee covers pre- and post-operative care, as well as the actual surgery. In surgical cases in which the vision can be improved by glasses, refraction and dispensing of glasses are included in the surgical fee, but the cost of the glasses is not included.

A special day rate for hospitalization was worked out with the Kansas Hospital Association. This fee covers the cost of a ward bed, general nursing care, board and room, necessary medicine, drugs, dressings, and laboratory tests. An additional fee is paid for operating room service. Medicines prescribed in the doctor's office are paid for by the attending ophthalmologist and reimbursement made by the Division of Services for the Blind.

Blood Wassermanns drawn in the doctor's office are sent to the Public Health Laboratory of the State Board of Health. Laboratory tests for blood Wassermann, spinal fluid, blood count, urinalysis, etc., when taken in the hospital, are sent to the hospital laboratory. When such facilities are not available, specimens are mailed in the usual manner to the state laboratory. Special tissues may be sent to the laboratory of a private pathologist and the state supervising ophthalmologist consulted regarding the fee for this service. *X*-ray examinations are made at the request of the attending ophthalmologist but are limited to examinations of the orbit or of the head.

The attending ophthalmologist may avail himself of the consultation of another doctor. In these instances a fee is allowed for consultation service but no transportation expense is allowed for the consulting physician. Special nurses may be engaged at the prevailing rates in the community.

During the early part of May, 1938, the state supervising ophthalmologist supplied the Division of Services for the Blind office with a list of names of Aid-to-the-Blind recipients who were eligible

for restoration of sight treatment on the basis of the diagnosis, prognosis, and attending ophthalmologist's recommendations contained on the eye examination reports. These cases represented an accumulation from the beginning of the Aid program, but were readily accessible in the supervising ophthalmologist's file of potential treatment cases. The Division office then sent lists of these eligible cases to the county departments of social welfare in the respective counties in which the clients resided so that plans for treatment could be initiated for those individuals desiring it. By the middle of May, 1938, the restoration of sight program was well under way with current applicants for Aid-to-the-Blind, as well as previous recipients, receiving treatment.

A summarization of the restoration of sight program, after it had been in operation for approximately eight months, was made on December 31, 1938. During this period the supervising ophthalmologist approved 434 cases as eligible for treatment and notified the county departments of social welfare that the service was available for their clients. Treatment had been completed in 83 cases at a total expense of $6,591.51, or an average cost per case of $79.41. At the end of the period 118 cases were under treatment and no indication had been made that the 233 additional eligible persons intended to avail themselves of the medical care.

Of the 83 individuals for whom treatment had been completed during 1938, 63 had achieved a restoration of vision sufficient to make them ineligible for Aid-to-the-Blind.

An analysis of the progress of the restoration of sight program made toward the end of 1938 by the supervising ophthalmologist revealed a group of cases needing immediate treatment which were ineligible for this service under the program. The group included those applicants for Aid-to-the-Blind who were found ineligible through an eye examination, but who had eye conditions which, if not treated, would result in a greater loss of vision and in some cases probably result in blindness. The supervising ophthalmologist recommended the inclusion of these cases in the treatment program of the Division of Services for the Blind and estimated that the cost of providing this service would be less than treatment for restoration of sight cases, since in most instances it would be administered in the doctor's office, eliminating surgical and hospital fees.

The Conservation of Eyesight Committee expressed approval of extending the treatment program and indicated particular interest in glaucoma patients excluded from the restoration of sight program because of ineligibility for Aid-to-the-Blind.

On January 10, 1939, the State Department of Social Welfare passed a minute setting aside $5,000 of the $50,000 previously designated for expenditure by the Division, for the purpose of providing necessary eye treatment for indigent persons having more vision than allowable for Aid-to-the-Blind.

The extending of medical care to this new group of cases was called the prevention of blindness program. It was decided to use the same forms and procedure for these cases as were being used under the restoration of sight program. It thus developed that if an applicant for Aid-to-the-Blind is found upon eye examination to be in need of treatment, it can be extended at the discretion of the supervising ophthalmologist regardless of the present extent of the applicant's vision. However, in order to be eligible for treatment under the prevention of blindness program, the applicant must be accepted for some type of public assistance, which in these instances is other than Aid-to-the-Blind.

When the supervising ophthalmologist finds an applicant ineligible for Aid-to-the-Blind but feels that treatment is indicated, he notifies the county department of social welfare of the applicant's ineligibility for Aid in the usual manner but also notifies the county that treatment is available under the prevention of blindness program. Subsequent steps follow the restoration of sight program procedure except that all forms bear the notation "Prevention of Blindness" for accounting purposes.

On February 16, 1939, individual letters were sent to county departments of social welfare on approximately 50 cases which had become eligible for treatment with the initiation of the prevention of blindness program. This represented an accumulation of cases obviously in need of treatment which had been rejected for Aid-to-the-Blind during the preceding months. These cases were the first to receive treatment under the new program which has continued to function to the present time.

The activities of the Division of Services for the Blind were heartily endorsed by the Kansas Association for the Blind, an or-

ganization made up primarily of blind persons, and were brought to the attention of the 1939 session of the Kansas legislature. The result was that in April of that year the legislature earmarked $75,000 of sales tax money for expenditure annually for the restoration of sight, prevention of blindness, and the rehabilitation of blind persons.* These funds became available to the State Department of Social Welfare May 1, 1939. The 1941 legislature earmarked a similar amount for these purposes to be spent during the two succeeding years.† The legislature in 1939 also removed the age limitation for recipients of Aid-to-the-Blind.‡ The original Social Welfare Act specified that an applicant for this category of assistance must be sixteen years of age or older, but with the discarding of this requirement medical care under the restoration of sight and prevention of blindness programs automatically became available to individuals of all ages.

From the beginning of the Aid-to-the-Blind program in September, 1937, until November 1, 1941, eye examinations were secured on 4,203 individuals. Of this number, 418 received two or more re-examinations. Of these cases, 1,054 were declared eligible for restoration of sight treatment. Six hundred and sixty-seven persons accepted treatment, 139 of whom were under treatment on November 1. Of the 528 cases in which treatment had been completed, 325 persons achieved restoration of sight in varying degrees, but in all instances sufficient to remove them from the Aid-to-the-Blind category. For various reasons, 387 persons did not accept treatment. Up to this date $59,879.95 had been spent under the restoration of sight program at an average cost per patient of $113.41.

During the period from the initiation of the prevention of blindness program to November 1, 1941, 537 cases were declared eligible for treatment. Of these persons, 434 accepted treatment, 114 of whom were under treatment at the end of the period. One hundred and three persons had not yet accepted the available medical service. A total of $17,149.73 had been spent at an average cost per patient of $53.59.

The following tables present a partial breakdown of completed treatment cases under the restoration of sight and prevention of

* Chap. 334, 1939 Session Laws.
† Chap. 383, 1941 Session Laws.
‡ Sec. 2, Chap. 200, 1939 Session Laws.

blindness programs on the basis of the eye conditions for which treatment was extended:

RESTORATION OF SIGHT PROGRAM

Eye Condition	*No. completed treatment cases*	*Percentage*
Cataract	300	57.0
Serious refractive errors	68	13.0
Glaucoma	34	6.5
Trachoma	29	5.5
Various other conditions	97	18.0
Total	528	100.0

PREVENTION OF BLINDNESS

Eye Condition	*No. completed treatment cases*	*Percentage*
Refractive errors	176	55
Glaucoma	30	9
Cataract	25	8
Pterygium	22	7
Enucleation	22	7
Trachoma	12	4
Various conditions	33	10
Total	320	100

According to figures published by the Social Security Board, Kansas ranks second among the states in the number of Aid-to-the-Blind cases closed because of complete or partial restoration of sight.* Using the average amount of Aid-to-the-Blind grants in Kansas as a basis, it can be estimated that a saving to the Aid-to-the-Blind program of approximately $6,500 monthly is resulting at present from the fact that needed medical care was provided for recipients under the restoration of sight program. In addition it is reasonable to assume that at least a portion of the 434 patients who received treatment under the prevention of blindness program would have become Aid-to-the-Blind recipients if medical care had not been provided.

Although Kansas ranks sixth among the states with reference to

* Research Memo No. 1, April, 1941, p. 30, Table No. 26, "Reasons for Closing Aid to the Blind Cases During Fiscal Year 1939–1940."

the number of Aid-to-the-Blind recipients per 100,000 population* it is apparent that this ratio would be much higher if the restoration of sight and prevention of blindness programs were not in operation.

A number of activities are carried on by the Division of Services for the Blind, other than actual medical care, which are designed to prevent blindness and to increase the effectiveness of the medical programs. The duties of the staff member of the Division of Services for the Blind previously employed as field secretary to the supervising ophthalmologist have been altered so that she functions at present as a medical social worker with more than 50 per cent of her time available for field work. With follow-up attention on treatment cases as her primary interest, she visits the county departments of social welfare throughout the state, remaining in each county for an indefinite period, depending on the amount of work to be done. All county case records on cases approved for treatment are studied and conferences held with county social workers responsible for the cases in question. Case by case eye conditions and their implications are explained to county workers and suggestions made for any services which seem indicated. Reasons for failure of clients to accept available treatment are determined and interpretations of what treatment involves made to the client. Frequently pertinent information is secured regarding treatment cases, which is incorporated in the Division's case records and is of assistance to the supervising ophthalmologist in approving additional medical care.

While in the county this worker confines her entire attention to problems of eye health and contributing factors and acts in an advisory capacity. Before leaving the county she prepares written recommendations for completing medical-social treatment plans on all cases where service is indicated. For demonstration purposes, chiefly, she personally follows through on ten or twelve cases.

The providing of adequate personal follow-up service on medical-eye problem cases cannot be done with a small state staff and the medical social worker's chief task is to educate and stimulate the county social workers to the end that this very important work will be done. However, while in a community, the worker also makes contacts with school officials, health agencies, civic organiza-

* Social Security Board *Bulletin*, September, 1941, p. 43.

tions and community leaders in an effort to encourage and coordinate local efforts designed to prevent blindness and conserve eyesight.

For the purpose of focusing interest on the prevention of blindness and effecting co-operation between state agencies whose function requires them to be interested in eye health, the Division promoted the organization of an interdepartmental committee on the prevention of blindness. On this committee are representatives from the State Departments of Health, Public Instruction, Labor, Child Hygiene, and Social Welfare. Periodical meetings are held at which ideas are exchanged, agency functions explained, unmet needs discussed, and future action recommended.

A definite inter-agency co-operation plan has been worked out between the Division and the Kansas Crippled Children's Commission.* The arrangement was indicated inasmuch as the latter agency is legislatively† required to provide medical care for children with congenital cataract. This arrangement provides for referrals between agencies, prevents duplication of service on cases, and promotes more or less of a pooling of the resources of the respective agencies for the benefit of particular cases.

The Division of Services for the Blind realizes that the education of children is the responsibility of educational authorities. Recognizing, however, its responsibility for helping to find children whose eye condition is such that special medical and educational facilities are necessary, the Division is co-operating with boards of education by encouraging nursing organizations and ophthalmologists to assist in finding such children. In one case the Division gave financial assistance in order to insure the continuance of the class in Wichita, established in 1937.

As a result of this co-operation with the boards of education in various communities, it has been found that many children needing the advantages of special education are scattered in communities too small to warrant the establishment of special classes. The Division, therefore, in further co-operation with boards of education, is providing Clear Type books to be loaned by the educational authorities to children recommended by ophthalmologists and teachers. The Division realizes that books are of little value unless

* Chapter 65, Article 5A, General Statutes of Kansas, 1935. † *Ibid.*

teachers are given assistance in understanding the educational and social needs of partially seeing children. It trusts that its efforts toward demonstrating these needs will result in a well-planned program adequately supervised by the state and local departments of education for all partially seeing children in urban and rural areas.

A number of public information activities have been undertaken by the Division for the purpose of promoting eye health and safety and to interpret the programs being carried on. Lecturers are made available to special groups, program material provided for civic organizations, exhibits held at conventions and meetings, radio time used, and illustrated leaflets regarding care of the eyes given wide distribution.

A description of the program for visually handicapped persons in Kansas would be incomplete without an acknowledgment of the assistance given prior to its initiation and during various stages of its growth by the National Society for the Prevention of Blindness and the American Foundation for the Blind. These organizations, through their competent staffs, have done much to stimulate and give direction to the program's development.

Since the restoration of sight and prevention of blindness programs have been in operation many problems have been confronted, such as the lack of community facilities for general medical care for indigent persons to complement the eye treatment; the fact that many aged clients prefer to exercise their right to apply for Old Age Assistance rather than Aid-to-the-Blind and consequently cannot be served under the treatment programs; and the occasional incomplete reporting by ophthalmologists on eye examinations which necessitates requests being made for additional information. But the greatest problem that has arisen has grown out of the fact that under the procedure for the two programs cases are selected for treatment from those persons receiving eye examinations in connection with applications for Aid-to-the-Blind. The problem is no longer acute because the county departments of social welfare have become more familiar with the intent and procedures of the programs, but there is still somewhat of an incentive for local agencies to use the application for Aid-to-the-Blind as a method of securing an eye examination and possibly treatment for individuals

who are obviously not blind or near blind. The result is that close watch must be kept to see that the rejections for Aid on the basis of the eye examination do not get out of reasonable proportion to the acceptances for any one county since this would possibly indicate that improper referrals were being made for eye examinations.

This problem is a natural outgrowth of providing medical care, when needed, for persons applying for Aid-to-the-Blind. Plans are now under way to work out an alternative method of making treatment available, which it is hoped will prevent abuse of the Aid application and at the same time broaden the scope of the treatment programs.

The Kansas program is still comparatively young, but we optimistically feel that our experience thus far will equip us to build a better program for the future.

Sight Restoration and Patients' Reactions*

Edith E. Gutzeit

A STUDY of fifty-six cases referred to the Prevention of Blindness Department, Dauphin County Branch, Pennsylvania Association for the Blind, by the Conservation of Vision Department, State Council for the Blind.

THE Dauphin County Branch of the Pennsylvania Association for the Blind, a private agency located in Harrisburg, has, since June, 1936, carried on a program for the prevention of unnecessary blindness and the conservation of vision. As one means of furthering this objective, the agency has accepted clients who were referred by the Conservation of Vision Department, State Council for the Blind.† These individuals were felt, by the consulting ophthalmologist of the State Council for the Blind, to be amenable to medical or surgical treatment to help maintain, improve, or restore vision, and they were referred for social case work services which would enable them to follow through on the recommendations made.

Because of the growing interest in the conservation and restoration of vision, an examination of the latter service was made to determine results and what changes might be desirable. The study included 56 persons: 20 men and 36 women. Although their ages ranged from 32 to 88 years, the majority (79 per cent) were over sixty years of age. Most persons appeared to be in good health

* Condensed from thesis, under the title, "Case Work Services to Visually Handicapped Adults," submitted as partial fulfillment of requirements for the Master of Science degree in Social Administration, School of Applied Social Sciences, University of Pittsburgh.

† The State Council for the Blind, created in 1925, is a departmental administrative board within the Department of Welfare of the State of Pennsylvania. It conducts a program "for the prevention of blindness and for improving the condition of the blind" (Act No. 412, May, 1925, p. 1). The Conservation of Vision Department carries on a state-wide program for the prevention of blindness and encourages the co-operation of all agencies engaged in related activity.

and to function as normally intelligent individuals. Three persons were employed: one as a stenographer, one as a housekeeper, and one as helper in a bakery. The income in 38 homes was obtained either entirely from the Department of Public Assistance, as in 12 instances; or supplemented by it, as in 26 instances. Eighteen in the group were supported entirely by private income. Only three of these, however, could afford ophthalmologic care; two others were able to pay the reduced rate for glasses.

While visual acuities at the time of referral ranged from 20/30 to total darkness, the majority—40 persons—had vision of only 20/200 or less in the better eye. Twenty of these persons had sufficiently low vision to be eligible for blind pensions (10/200 or less in the better eye). Recommendations for eye care included: cataract extractions, 32; treatment or periodic supervision, 19; refractions, 3; contact lens, 1; and Wassermann test, 1. Twenty-five persons had had no ophthalmologic care in connection with their present eye condition; 16 were receiving eye care at the time of referral; 11 had previously accepted surgery or treatment, largely for acute pathology; and eye care for 4 was unknown.

Living arrangements were as follows: 42 persons lived with married children or in their own homes; 14 lived alone. Frequently, satisfaction or dissatisfaction experienced in home life appeared to be a factor in the client's consideration of eye care. Clients living with married children felt secure, generally, when they were able to assume responsibility in the home or when they were able to contribute financially toward their support. Clients who had to be entirely dependent on their children, contrary to their wishes, sometimes expressed their insecurity in their attitude toward eye care. To illustrate:

> Mrs. Y. had been accepted by her children, with whom she lived for alternating periods, while she was able to contribute toward her support from her blind pension. When a cataract operation in one eye, supplemented by a preliminary correction (sometimes given as a temporary aid in seeing until such time as a final refraction is possible), made her ineligible for a blind pension, one of her children expressed a great deal of hostility against the worker because total responsibility for Mrs. Y.'s maintenance was now placed on the children. It was interesting to note that Mrs. Y. refused to be refracted

even though she knew better vision might be expected. She likewise refused to have the second cataract extracted. It appeared to the worker that she was trying to justify her dependency on the grounds that she saw too poorly to maintain herself.

With two exceptions, clients who lived by themselves appeared to feel a lack of association with persons with whom they might discuss the details of everyday living and share the discomforts of illness. Several tried to meet this need, in part, by contacting the agency frequently to talk with the social worker about their eye care. This gave the worker opportunity to direct the conversation into channels which would aim to ease their fears and make it possible for them to continue eye care. For instance, Mr. N., who had a diagnosis of incipient cataracts, called at the agency after and between clinic visits because he "thought the worker might want to know what was happening next," to his eyes.

The Needs of the Group

The needs of the group as evidenced by the study were fourfold. The first need was to understand the reason for referral and the services which the private agency had to offer. Since all but four persons in the entire group had applied for Blind Pensions, had supplied information necessary to establish eligibility, including eye examinations which had been scheduled by the Blind Pension Fund,* they seemed confused as to the identity and purpose of the private agency of which many had not heard. The second need of the patients was to understand the diagnosis of the eye condition, possibility for treatment, and the resources available. Very few had a clear concept of the causes of their eye troubles; some did not even know the diagnosis. In order to follow recommendations intelligently clients needed to understand, in simple terms, the implications of their trouble and the importance of adhering to treatment prescribed. Clients with glaucoma, for example, wondered why they had to use medication regularly, when to them the drops felt "like water" and did not improve their vision. Persons suffering from syphilis or diabetes had to be helped to realize that care of the general disease was essential. The third need of the clients was

* Administered by the Department of Public Assistance.

to receive understanding, knowledge, and emotional support in order to enable them to deal with their own fears and to initiate or continue eye care. One elderly client was so beset by her problems that, although her symptoms were annoying, eye care became only of secondary importance:

> Mrs. B. was living on very diminished savings. She was ineligible for blind pension because her vision exceeded the limit permitted. She did not wish to accept relief because it meant "signing over her house" and yet she could hardly manage. A daughter in another state suggested that she sell the house and come to live with her, but Mrs. B. feared that her son-in-law would not want her. Medication to be used in each eye three times daily was discontinued because Mrs. B. could not put the drops in her eyes because of arthritis in her hands, and she felt that she was imposing on the neighbors.

There seemed to be a need for clients to express in some detail the history of their eye conditions, prevailing symptoms and the hesitancy with which they approached the thought of eye care, especially surgery. Seldom was there enough time for them to talk to the busy oculists in the clinics, whose remarks were often misunderstood. Moreover, even when clients understood, there were frequently needed the knowledge and skill of the social worker to help them deal with and overcome certain social and emotional factors which interfered with the carrying out of the oculist's recommendations. Finally, the clients needed to have leisure time activities adapted to their present visual condition, and related to their former and present interests, pending completion of eye care. It was felt that such activity would have the values of occupying the time left free by inability to pursue accustomed activities which required eyesight; of giving the client a feeling of usefulness and creating an opportunity for approbation of his efforts by others; and of helping him spend his time enjoyably and preparing him for blindness in the event that medical care should prove unsuccessful by giving him the confidence of being able to do things without the use of sight.

An attempt was made to fill all but the last need, for which there are, as yet, insufficient resources within the agency. Interpretation was made of the motive for referral and information was given concerning the services which the agency was set up to offer. The

worker aimed to develop a relationship with the client which would release him sufficiently to discuss with her his conception of his eye condition, to express his feelings toward the recommendations made and his reactions to accepting the eye care which was available to him. In interviewing, the worker listened to the client, followed his words and feelings and tried, gradually, to correlate her helping process with them. In some instances immediate plans for medical care could be discussed; in others, especially when surgery had been advised, no attempt was made to hasten a decision until the client had time to think the matter through. Several patients were unable to accept their diagnoses. In such cases it was felt wise to go along with them until they were prepared to do so. To illustrate:

> Mr. N., an elderly unmarried man, rejected the diagnosis of incipient cataracts because he seemed to be afraid of the threat it implied. Repeatedly he insisted that the trouble did not lie with his eyes, but with the oculist at the clinic who had refracted him "in a hurry." Disturbances in his vision were accounted for by the fact that his glasses "were no good." Efforts made to discuss his diagnosis with him and to allay his fear were unsuccessful. A further attempt to show interest was made by listening to his complaints and by arranging to meet him at the clinic. On the appointed day, Mr. N.'s eyes were examined by Dr. A., who had just come on the clinic staff. Dr. A. impressed Mr. N. favorably, because he let him talk freely and because, according to Mr. N., he had taken "special pains" to improve his vision with glasses. Mr. N. "knew" he would see better. Glasses, including a new frame required at this time, were supplied by the agency. This appeared to give Mr. N. further satisfaction. Although he admitted his diagnosis for the first time, since it had been confirmed by Dr. A., he was not quite ready to accept it. He told the worker that "they tell me I have beginning cataracts, but I'll never let them cut *my* eyes." He nevertheless followed Dr. A.'s advice and reported to the clinic every two months for observation, and following each visit he reported to the worker in detail what had happened. For a time he suffered from diplopia, or double vision. With Mr. N.'s knowledge, this was reported to Dr. A. previous to Mr. N.'s next clinic visit. When the worker saw him several weeks later, Mr. N. said, "Dr. A. said my eyes are in pretty good condition. If they get worse, maybe they'll have to operate, but I won't let them do it until my sight is completely gone."

Clients were encouraged to contact the agency any time they felt that the worker could be of help. Information was given concerning resources for medical care and, when necessary, assistance was given in obtaining them. Effort was made to meet the clients' emotional needs, namely, need for recognition and need for emotional support, often described as "standing by," throughout the period of medical care. In one case, service was rendered entirely by consultation with the client's husband:

> Mr. W. came to the agency to talk about his wife's eye care. The elderly couple were supported by Old Age Assistance, although frequently Mr. W. managed to find light work which enabled him to meet their expenses. Mrs. W.'s diagnosis, senile cataracts, had been made at the office of Dr. S., whom she had consulted as a private patient for a number of years. Mr. W.'s concern centered about his wife's diagnosis, need for treatment, and lack of money required for care. His first concern appeared to center around the diagnosis, treatment, and prognosis; he asked questions about cataracts and cataract operations, in general. Mr. W. related the information Dr. S. had given him but he said he had not "dared to take Dr. S.'s time" to ask all the general questions he had in mind. Discussion concerning operation, hospitalization and post-operative eye care was initiated in this interview, but was continued in a later interview as Mrs. W.'s eye care progressed. Mr. W. was referred to Dr. S. to discuss his inability to meet probable expenses because Mrs. W. was still his patient and he was apparently showing considerable interest in her. Mr. W. admitted that oculists sometimes took care of patients in poor circumstances, but his pride made it difficult to approach Dr. S. He nevertheless decided on this plan, because he knew that Mrs. W. had faith in Dr. S. Worker saw Mr. W. at various times. She learned that Dr. S. had given his services free and that he had arranged free hospital care for Mrs. W. The last time Mr. W. called, he asked the agency's assistance in buying Mrs. W.'s glasses as he felt he could not afford to pay the price Dr. S. might charge. Again it was suggested that he discuss the matter with the doctor, although the worker made it plain that if Dr. S. were willing, the agency might consider this request. It was later learned that Dr. S. had charged a very reasonable price and had permitted Mr. W., who was then working, to pay in installments.

Results of Medical and Social Treatment

A survey of the patients showed that 36 persons (64 per cent) had accepted medical care; 20 did not. An analysis of the findings indicated the following facts:

Accepted Eye Care	36 persons
Improvement in vision	19
Vision maintained	7
Vision restored	7
Vision increased	5
Lack of Improvement in Vision	17
Eye care not completed	8
Decreased vision	6
Eye care contraindicated	3
Did Not Accept Eye Care	20 persons
Total	56

Twenty-two of the above 36 had ophthalmologic care for treatment and observation of conditions, including fundus pathology, glaucoma, and incipient cataracts. Ten of the 36 persons had cataract extractions. Of the remaining four, two persons were refracted; one person was fitted with a contact lens; and one had a preliminary cataract operation. The vision of 19 persons (34 per cent) was found to have been maintained, improved, or restored. This figure of 19 is a conservative statement, for six other patients whose treatment was incomplete at the close of the survey period were counted in the "No improvement" group discussed below. Seven of the 19 persons were able to maintain their vision; another 7, following cataract extractions and the fitting of proper glasses, had vision restored: of these, 5 recovered close to normal vision, two had 20/70 and 20/200 vision, respectively, the latter with a preliminary correction. Five of the 19 persons had improved vision: of these two, 20/30 and 20/70 vision, with correction, respectively, following treatment for pathology; two, 20/100 and result unknown, respectively, following refraction; and one, 20/30 with a contact lens.

Seventeen persons, 30 per cent of the 56 persons referred, had no improvement in vision at the time the study ended. Eye care for six of these persons had not yet been completed, as previously

stated. Six others had decreased vision for the following reasons: unsuccessful cataract operations, three; slowly maturing cataracts, two; and degenerative eye disease, one. Eye care to improve or restore vision was contraindicated for three persons following study by ophthalmologists. Two other persons did not benefit by eye care: one could not tolerate her new correction; the other died before eye care was completed (the last two are included in the table under the heading "Eye Care Not Completed").

Twenty persons in the group (36 per cent) did not accept eye care. The following were contributing factors in the various situations: advanced age and poor health, apparent acceptance of blindness, seeming indifference because the remaining vision had appeared constant for several years, and useful vision in the better eye.

Improvement or maintenance in vision made it possible for 9 persons to continue, accept, or assume *completely*, responsibilities in their homes. In some cases the influence of restored vision was as great on other members of the family as on the client, restoring a normal balance within the home.

To illustrate:

> Mrs. G.'s two children, of adolescent age, had had to assume responsibility for managing the household because their widowed mother had lost her sight due to maturing cataracts. When Mrs. G.'s vision was restored, she was able to resume her rightful place in the home and her children were able to share, more completely, the normal experiences of others in their age group.

Eight persons helped by ophthalmologic care were able to pursue or to continue the simple activities which their routine of living required, with a reasonable amount of independence. Three others were able to continue employment, and one person was finding improved vision to be increased stimulation to seek employment. Eight of the number who had been receiving blind pensions became ineligible for this aid because of increased vision. It is possible to estimate a saving of $360 annually to the commonwealth for each of these persons, but it is impossible to estimate the general human value brought about by the restored vision.

Conclusion

It is difficult to estimate accurately the value of case work services rendered. Work had not been, as yet, completed on all of the cases referred. There is, moreover, a likelihood that a few of the more resourceful persons in the study who accepted medical care following the worker's efforts might have done so eventually of their own accord. On the whole, however, it appeared that most persons needed to express their concern about their eye conditions, to receive interpretations of their physical difficulties, and to have information concerning resources. Likewise, most persons appeared to find it more possible to accept medical care when they knew that the agency would stand by.

Note and Comment

Summer Courses for Training in Sight-Saving Class Work.—Four colleges and universities, in co-operation with the National Society for the Prevention of Blindness, are offering courses for the training of teachers and supervisors of sight-saving classes this summer (1942). The institutions and the dates of these courses are as follows:

Peabody College for Teachers, Nashville, Tennessee
June 22–August 1.

Wayne University, Detroit, Michigan
June 29–August 7.

State Teachers College, Buffalo, New York
June 29–August 7.

Teachers College, Columbia University, New York, N. Y.
July 6–August 14.

These summer courses will be of interest to teachers preparing to take charge of special classes for the education of children with seriously defective vision, and the courses will be helpful for nurses and social workers whose responsibility it is to aid in conserving the sight of the children under their care.

Recent legislation regarding the education of handicapped children has stressed the fact that children in rural communities, as well as those in cities, should be given special educational opportunities. Since few states have special supervisors for the partially seeing, it is advisable for supervisors of elementary education—state, city and county—to take advantage of the opportunities offered by these courses to prepare themselves to give the necessary aid to teachers in communities too small to warrant the establishment of sight-saving classes.

Details regarding the courses may be obtained from the respective colleges or from the National Society for the Prevention of Blindness, 1790 Broadway, New York City.

Society's Program for the National Conference of Social Work.—The National Society for the Prevention of Blindness will par-

ticipate in the National Conference of Social Work this year by maintaining an exhibit booth for conferences and conducting four sessions during the Conference. Two of the sessions will be conducted jointly with the American Association of Medical Social Workers on the subject of "Consultation—Its Meaning, Processes and Relationship," and one joint session will be held with Section One—Social Case Work, Group Meeting 3, under the title of "The Importance of the School Program in Case Work with Exceptional Children." A final meeting will deal with the topic, "The Public Welfare Agency's Opportunity to Conserve Sight."

Fourth of July Fireworks Injuries.—Celebration of the Fourth of July in 1941 resulted in 2,039 fireworks injuries, according to the "Fifth Annual Summary of Fourth of July Injuries Due to Fireworks and Explosives," published by the *Journal of the American Medical Association*. These included the loss of vision of one or both eyes in 9 individuals, and eye injuries to 104. These figures represent a substantial reduction from the record of 1940, when 214 serious eye accidents occurred, 15 of which resulted in blindness in one or both eyes.

The *Journal* reports a striking improvement between 1940 and 1941 in the following states: Alabama, Arizona, Kansas, Kentucky, Maine, Nebraska, New Jersey and Oklahoma. The improvement in Arizona is probably due to a control bill in 1941; in Kentucky a regulatory law is in effect; Maryland adopted a new law this year; the marked reduction in accidents in New Jersey may be due to an embargo placed on all shipments of fireworks into the state and the effectiveness with which the new law in its neighboring state, New York, was enforced. From the records available, the states which need adequate state law enforcement most are Ohio, Illinois, Massachusetts and California. Of these, Ohio and Illinois have laws which are to become effective for the Fourth of July, 1942.

Commenting on the findings, the *Journal* says: "As has been pointed out repeatedly in these reports, the reduction of fireworks injuries is dependent not only on adequate state legislation but on enforcement as well. . . . In the five years since these reviews have been resumed, the total number of unnecessary accidents of this nature has declined from 7,205 in 1937 to 2,039 in 1941. This

source of death and disfigurement can be still further reduced, especially by prompt enactment and enforcement of suitable legislation in those states, such as Massachusetts and Rhode Island, which do not have effective laws. Ohio and Illinois, if adequate enforcement is attained next year, should show considerable improvement. In view of the experience of the last two years the California legislation should receive prompt attention with a view to making it serve the purposes for which it was presumably intended."

Vision in Our National War Effort.—Under this title a one-day institute was held in the Pennsylvania State College of Optometry in Philadelphia, Pennsylvania, January 22, 1942, under the joint auspices of the College and the Pennsylvania Optometric Association. Among the topics presented were: "Safety Measures and Eye Health Service," by Joseph A. Haller, Director of the Department of Safety, Maryland State Industrial Accident Commission; "Ophthalmologic and Optometric Collaboration in the National War Effort," by Dr. Ronald C. Moore, of Philadelphia; "The National Government and Eye Health Care," by William T. Cameron, Chief Safety Adviser, National Committee for the Conservation of Manpower in Defense Industries; and "Vision in Our Armed Forces—The Navy," by Dr. C. A. Swanson, Bureau of Medicine and Surgery, United States Navy. It is interesting to note figures quoted by Dr. Swanson to the effect that, among 98,000 volunteers for the Navy recently, it was found necessary to reject 58,000 because of physical defects, of which 8,679 were for eye defects.

In concluding the institute, Dr. H. Ward Ewalt, Jr., President of the Pennsylvania Optometric Association, made the point that many older workers are now being used in industry and that men are working longer hours, thus increasing the possibilities for visual fatigue, which is such an important factor in industrial accidents. He also pointed out that the majority of workers do not have preemployment eye examinations or any kind of periodic examinations. He spoke of the need for more eye specialists in the country, particularly because of the growing need for them in industry; he called attention to the fact that 90 per cent of American workers are in plants that do not have any safety engineers.

Vitamin A and Color Blindness.—By taking more than four times the amount of vitamin A recommended as the daily requirement of an adequate diet, a group of eight color-blind college students made an average of only half as many errors in seeing colors after twelve days of treatment, reported Dr. Robert D. Loken, of the psychology department of the University of California at Los Angeles. The color blindness of the students given the vitamin A treatment ranged from a slight red-green confusion to large error scores over a wide range of color, when tested by a revised form of the Nela test of color vision. Some made as many as 21 errors out of a possible 24.

Dr. Loken points out, however, that vitamin A cannot yet be considered a cure for color blindness, that his is only a preliminary experiment and many other factors must be investigated. "There is no implication," he says, "that all or any cases now unfit for industrial purposes because of color-vision deficiency might benefit sufficiently from vitamin dosage to bring them up to the 'normal' level of color blindness."

Eyes Supplied by Dead for Living Blind.—The Dawn Society has recently been formed in California by forty members, each of whom has signed a written, legally binding pledge to give his eyes to the blind immediately after death. In recent years doctors have been successful in grafting corneal tissue from healthy eyes to eyes of those blind because of corneal damage, but they have been hampered by lack of healthy tissue for the operation. Under this plan both eyes of the members will be removed within six hours after death and stored in a light saline solution under refrigeration. Although the tissue will respond to grafting up to two weeks after removal from the donor, it is expected that it will not be necessary to store the eyes for more than a few hours or days—so great will be the demand. Blind persons may apply to their own physicians for the sight-restoring operation, and names of applicants will be listed and served in order of their receipt by the Dawn Society. The "gift eyes" may be sent to other cities and may serve various people.

Control of Epidemic Virus Conjunctivitis.—The prevention of epidemic virus conjunctivitis, an eye disease which recently has

been sweeping certain sections of the West Coast, "as of other infections concerning the eye, is definitely related to the prevention of contamination by soiled hands and linens," *The Journal of the American Medical Association* for February 7 advises in an editorial, adding that, "In industrial plants, medical control of the industrial worker is necessary." *The Journal* explains that although the cause of the disease has not yet been determined, all observers believe that it is a specific virus. The editorial says:

"During the summer of 1941, according to Holmes, a rapidly spreading type of acute conjunctivitis [inflammation of the membrane lining the eyelids] raged in Oahu, Hawaii. At first, patients and doctors called it 'pink eye.' However, when repeated cultures and smears were made from conjunctival scrapings and secretions from more than 50 cases, investigators found it impossible to determine any offending organism. In October a considerable number of cases began to appear in California, and the peak of the outbreak was reached in December. At that time authorities noted that 2 per cent of workers in some ship-building plants were affected, but the percentage of those affected was higher in special groups, such as welders, whose eyes are notoriously subjected to the trauma of light.

"After an incubation period of from two to five days the patients experience pain, excessive lacrimation [secretion of tears] and the feeling that some granular dusty body or some other foreign substance is in the eye. There is extensive edema [swelling], but a purulent discharge is seldom seen. The upper lids are usually reddened and swollen, and blepharospasm [spasm of the eyelid] is encountered. . . .

"In most instances the disease seemed to be self-limited. It pursues a leisurely clinical course, in the absence of complications, lasting from two to three weeks. When [complications] developed, the eyes remained irritated for from four to six weeks or longer.

"Thus far attempts to determine the cause of this conjunctivitis have been unavailing, but practically all the observers believe that a specific virus is responsible. . . . Studies are being continued in several laboratories with a view to isolating a virus or developing more information concerning the nature of the infection."

Book Review

SCHOOL HEALTH SERVICES. W. Frank Walker and Caroline R. Randolph. New York: Commonwealth Fund, 1941. 162 p. and appendices.

As 20 per cent of the population of the United States are school children, and medical inspection has steadily grown in volume since its introduction in the schools of Boston in 1894, this service has definite significance in relation to the health program of the nation.

In *School Health Services* we have at last a fair picture of successes and failures, with definite suggestions of further steps to be taken if the funds expended on school medical and nursing services are to bring maximum results.

The book is based on a study conducted in six counties of Tennessee, where the school health records of 58,000 children were available for a period of six years. A "large part of the study was directed to the consideration of medical findings at examinations, the defects corrected, the effect of a parent at the examination, and the effect of medical and nursing supervision before school entrance."

Vision findings will be of special interest to readers of the SIGHT-SAVING REVIEW. "Of the 56,160 children between the ages of six and sixteen years who had their first examination between 1930 and 1936, 54,487 had their vision tested. . . . The proportion of white and colored children at the time of the first examination shows for the group a rather gradual increase in the incidence of visual defects, from a little more than 2 per cent in the six-year-old children to practically 7 per cent at age sixteen. The incidence of defects in the colored group apparently is about the same in the lower ages as among the white, but is appreciably lower at the upper age level. . . . The attack rate of visual defects in relation to age is sharply at variance with that of other defects, being essentially constant at 2.5 per cent to 3 per cent every two years during school life, or an annual attack rate of 1.25 to 1.5 per cent. . . ." Though the study indicates that "approximately 10.5 per cent of all children will develop visual defects

by the age of thirteen years, 46.0 per cent" of these same children will show normal vision at a subsequent examination. "Under the conditions of rural life in the six counties studied, 13.1 per cent of white children and 6.3 per cent of colored children secured corrections of visual defects." The value of parents being present at the examinations, visits of public health nurses, and a second examination of vision is demonstrated.

The report does not attempt to furnish all the answers, but rather indicates that, as health examinations of school children require a large proportion of county public health officers' attention, the departments conducting school services must continue to analyze their programs to determine, if possible, such questions as "What are the reasons for the change in vision rating from first to second examinations? What part of this change is due to a difference in visual acuity and what part is associated with age?"

In an excellent closing chapter entitled "What Should the School Health Program Be," the health education phases are discussed. "As with other subjects, the major responsibility for teaching the scientific facts of health and disease, the importance of sound personal, family, and community health, and the ways to achieve it, rest with the schools. However, the success of the general public health program depends so greatly upon the individual and community understanding, acceptance, and the use of this knowledge that the health department has a fundamental interest in this phase of school service. . . . The role of the health department personnel in this field should be that of the practical demonstrator. The physical examination at entrance may be the child's first experience with a health examination." The report leaves the reader in no doubt as to the opportunity for health promotion inherent in the process of examining school children.

The book is thoroughly documented, with statistics clearly presented. The lay-out and type are examples of good craftsmanship. Health workers, concerned with any or all phases of promoting and maintaining the health of the school-age child, will find enlightenment in this much needed study designed to answer the question, "How effective are school health services?"

—Sally Lucas Jean

Briefer Comments

MANUAL OF THE DISEASES OF THE EYE. Charles H. May, M.D., with the assistance of Charles A. Perera, M.D. Baltimore: William Wood & Co., 1941. 519 p.

This seventeenth edition does not differ in size or scope from previous editions. Occasional passages have been rewritten for increased clarity rather than for any appreciable change in content; but wherever they have appeared, new developments are described, as in the case of a third operative technique for retinal detachment. Two new colored plates have been added: one presenting one each of the series of Stilling's and of Ishihara's Pseudo-Isochromatic Plates for Testing Color Perception; the other showing the Koch-Weeks bacillus and the Morax-Axenfeld diplobacillus.

An appendix has been included giving the ocular requirements of the Army, Navy, Marine and Air Services of the United States Army.

HOW TO MAKE TYPE READABLE. Donald G. Paterson and Miles A. Tinker. New York: Harper and Brothers, 1940. 209 p.

This book, which sets forth scientific factors concerning the legibility of type, will be of interest to typographers, printers, advertisers, and all those concerned with the preparation of reading material. Kinds and size of type, width of line and its relation to size of type, leading and its relation to line width and type size, spatial arrangements of the printed page, black print versus white print, and printing surfaces and arrangements are among the topics discussed. To study and measure these standards, the authors gave reading tests to more than 33,000 students in colleges and in secondary schools. One of their most interesting observations was the frequent contradiction between the "facts," on the one hand, and common sense notions, printing practice and widespread theories about "good" typography, on the other.

The book is well arranged, and contains numerous figures and tables, as well as an extensive selected bibliography.

AUDIO-VISUAL AIDS TO INSTRUCTION. Harry M. McKown and Alvin B. Roberts. New York: McGraw-Hill Book Company, 1940. 473 p.

This is a useful compendium of information dealing with all types of audio-visual aids, such as motion pictures, radio, exhibits, lantern slides, etc. It has particularly valuable reference lists at the end of each chapter. Also helpful are the lists of sources—governmental, scientific and commercial—for such things as photographs, slides, charts, radio recordings and exhibit materials.

SAFETY IN THE WORLD OF TODAY. Herbert J. Stack, Don C. Seaton, Florence S. Hyde. Chicago: Beckley-Cardy Co., 1941. 372 p.

Prepared especially for pupils in the seventh to ninth grades, this textbook makes a valuable contribution to safety education. It is organized to permit effective use, either through integration with other subjects or when safety is taught as a separate subject. Of especial interest are the chapters on "Safety for the Worker" and "Organizing the School for Safety." A list of suggested activities that are not only practical but would be of interest to this age group is presented at the end of each chapter. The book is well illustrated and the material is related to the everyday experiences of boys and girls.

Contributors to This Issue

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